

September 28, 2000
Ref. No.: EOS/ETS-092800-C10

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. Willie Fuller
Code 581
Building 32, Room N212D

Subject: Contract No.: NAS9-98100
CSOC SODA Task Order Number GM36
EOSDIS Test System (ETS) Multimode Portable Simulator for PM-1
(MPS/PM-1) Delivery of the Release 6.0 Software

Dear Mr. Fuller:

We are pleased to deliver Release 6.0 of the ETS Multimode Portable Simulator for the PM-1 spacecraft (MPS/PM-1). This is the sixth and final major delivery using our Scalable, Integrated Multimission Simulation Suite (SIMSS) infrastructure and architecture with EOS PM-1 (Aqua) extensions.

The major capabilities added in this release include having multiple versions of the PDB in the Oracle database, viewing and setting of telemetry points in Engineering Units, triggering of scenario scripts in response to commands received, and retransmission of logged telemetry data. Attachment B to this letter provides a complete list of the simulator's capabilities. The new capabilities are highlighted. In addition, 12 Discrepancy Reports and Change Requests were resolved with Release 6.0.

A hard copy of the SIMSS/PM-1 User's Guide for Release 6 will be made available to the users in the near future. In addition, a soft copy of the User's Guide will be placed on the ETS Documentation web site at URL <http://esdis-it.gsfc.nasa.gov/ETS/etsdoc.html>.

This delivery package contains 12 attachments as listed below. A completed Mission Systems Configuration Management (MSCM) form is included in Attachment L. If you have any questions concerning this delivery, please call me at 301-805-3653.

Sincerely yours,

Estelle S. Noone
CSOC ETS Task Leader

EOSDIS Test System (ETS) Multimode Portable Simulator for PM-1 (MPS/PM-1)
Delivery of the Release 6.0 Software
September 28, 2000, Ref. No.: EOS/ETS-092800-C10

Delivery Package Reviewed and Approved by:

InHwan Oh
CSOC Quality Assurance

Janice Swope
CSOC ETS Customer Service Representative

The following attachments contain the details of the MPS software delivery.

- Attachment A - describes the delivery contents for this release
- Attachment B - describes the operational changes
- Attachment C - contains the instructions to build and install the software
- Attachment D - contains any special operating instructions
- Attachment E - contains a list of the resolved DRs
- Attachment F - contains a list of the unresolved DRs
- Attachment G - contains the matrix of requirements addressed by this release
- Attachment H - contains the known system limitations
- Attachment I - contains the release history summary matrix
- Attachment J - contains a listing of the delivery media contents
- Attachment K - contains documentation references
- Attachment L - contains the Mission Systems Configuration Management (MSCM) form

Distribution: (* - Letter Only)

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Johns, A. *	Luo, C. *		Johnson, W.	Blackwell, S.
Kelly, A.			Klem, K.	Burrows, P.
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Lehtonen, K. *	Lavery, K.		<u>Averstar</u>	Hepfer, L.
Ondrus, P. *			Messerly, R.	Noone, E.
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ESDIS Library	Thompson, S.		Winters, R.	Quintin, E.
				Shurie, E.
				Swope, J. *
				Task File

Attachment A – Description of Delivery Contents

The MPS/PM1 Release 6.0 consists of custom software executables that are being delivered on one CD-ROM. Two copies are being provided.

Enterprise Oracle and Oracle Programmer for Windows NT are necessary for operation of this release. These products were provided with a previous release. The license to use Oracle belongs to the CSOC contract. Therefore, Oracle and Oracle Programmer may be installed only on CSOC computers.

A soft copy of this MPS/PM1 Release 6.0 delivery letter and set of attachments is also being delivered. The attachments have been formatted on a 3.5" IBM PC diskette utilizing the MS WORD word processing tool.

Attachment B – Summary of Operational Changes

Operational Capabilities of MPS/PM-1 Release 6.0

(New or modified capabilities with this release are noted in *Italics*.)

Telemetry:

- Transmit telemetry in IP or Serial (clock/data) mode
- Pack telemetry packets and CLCWs into CADUs when in Serial mode
- Generate one stream of CADUs when in Serial mode
- Generate one stream of telemetry formatted as EDUs when in IP mode
- Start or stop one telemetry stream
- Ingest the PM-1 PDB files
- Generate telemetry packets from information contained in the PM-1 PDB
- Maintain telemetry nodes from information contained in the PM-1 PDB
- Populate telemetry packets with data values from information contained in the PM-1 PDB
- Generate correct secondary headers for SC, GIRD, and SUROM-TIE (no secondary header) telemetry packets using information from the PDB
- Generate instrument telemetry packets using secondary key information from the PDB
- Display EDU data when in IP mode
- Display CADU data when in Serial mode
- Set values into telemetry points by mnemonic
- Display telemetry node values by mnemonic
- *Convert telemetry values to Engineering Units (EU) for display using information from the PM-1 PDB*
- *Accept operator-entered telemetry values in EU and convert to Raw Counts for inclusion in telemetry packets*
- Reset packet count for the telemetry stream
- Static packet data can be overwritten (by byte location) and by modification of telemetry mnemonic
- Incrementing packet sequence counters per APID
- Generation of individual APIDs can be inhibited
- Telemetry logs will be created (viewable by offline utility)
- Packet Headers and Packet Data are updated
- Packet data can be shown in hexadecimal or octal format and addressed in hexadecimal or decimal form
- Packet Sequence Counters can be reset
- Packet Sequence Counters can be modified
- Packet Version field can be modified
- Packet APID field can be modified
- Packet Type field can be modified
- Packet SH Flag field can be modified
- Packet Length field can be modified

- CUC can be modified
- Packet rate may be controlled
- CLCW transmitted via EDUs when in IP mode
- IP packets are transmitted with variable lengths
- CLCW can be overridden by the operator
- Transmission of CLCW can be inhibited when in IP mode
- Scenario file (script) capability to set telemetry nodes and buffers
- Set telemetry data values in response to spacecraft commands received (end-item verification)
- Set initial telemetry data values at initialization
- Allow simultaneous display and set of multiple telemetry container items via GUI screens
- Simulate spacecraft memory dumps
- Use the PDB telemetry state text file to locate end-item verifier values
- Maintain and update telemetry data values in APID 1000

Command:

- Ingest command-related PM-1 PDB files
- Identify commands using information from the PDB
- Display event messages with command mnemonics and submnemonics
- Set telemetry points in response to commands received (end-item verification) using information from the PDB
- Recognize spacecraft Command Loads
- Display Command Load data
- *Copy Command Load data to a Memory Dump buffer*
- *Inhibit the Command Load data copy facility via operator directive*
- *Validate checksums of received Command Loads*
- Ingest type AD, BC, and BD commands
- Display Total CLTUs count
- Reset Total CLTUs count
- Display Rejected CLTUs count
- Reset Rejected CLTUs count
- Display Instrument commands count
- Reset Instrument commands count
- Display Spacecraft commands count
- Reset Spacecraft commands count
- Display BC commands count
- Reset BC commands count
- Display BD commands count
- Display current Spacecraft CLCW
- Update Spacecraft and instrument CLCW
- Display current Instrument CLCW

- Validate commands based on individual, all, or none of the following validation criteria: CLTU Start and Tail Sequences, BCH Error Code, Transfer Frame Header Fields, FARM (Valid Frame Sequence), User Command Packet Header
- Generate event messages based on ingest
- Log raw commands (viewable by offline utility)
- Display raw command in hexadecimal or octal format addressed in either hexadecimal or decimal fashion
- Display command packet headers for instrument commands
- Display command packet headers for spacecraft commands
- Update command accepted and rejected counters in telemetry

Time:

- Maintain and update SC time (GIRD)
- Maintain and update GMT time
- Synchronize SC and GMT times
- Maintain and update GIIS-formatted Day Segmented time for use in APID 1000

General:

- *Control all simulator module functions via scenario scripts*
- *Selection of scenario scripts may be via operator type-in or via a file selection browse window*
- *Start scenario scripts in response to commands received*
- *Start a scenario script from a scenario script*
- *Execute multiple scenario scripts simultaneously*
- *Provide operator control of multiple scenario scripts started by the operator*
- *Save the last 10 operator directives*
- *Allow editing of saved operator directives before re-execution*
- *EDOS Service Header (ESH) fields may be viewed*
- *ESH field contents may be modified by the operator*
- *Validation of Command Data Block (CDB) header fields of commands received*
- *Modification of expected values of CDB header fields*
- *All viewable buffers may be displayed*
- *Addition, deletion, and modification of command end-item verifiers via SQL scripts*
- *Logs of commands received or telemetry transmitted may be retransmitted via IP output*

Attachment C – Release 6.0 Installation Instructions

This attachment contains the instructions for installing the MPS/PM-1 Release 6.0 Server and Client, installing the new PDB ingest scripts, setting up the remote Oracle connection, and for installing initial and subsequent versions of the PDB. The accuracy of these instructions has been verified by independent test.

NOTES
Release 6.0 is capable of selecting one of multiple versions of the PDB stored in the Oracle database. For this reason the PDB must be re-ingested into Oracle prior to initializing the simulator for the first time.
The PDB database created by the new scripts is NOT useable by previous versions of the simulator. Previous releases only expect one version of the PDB to be in the Oracle database.

Instructions for installation of the PM-1 Server and Client software:

1. Insert the delivery media into the appropriate drive.
2. To install the PM-1 Client:
 - a) On the desktop, click on the Start button, and then select Run from the resulting menu.
 - b) When the Run window appears select the Browse... button.
 - c) From the Browse Window, select the Removable drive that contains the installation disk
 - d) Click on the Client folder.
 - e) From within the Client folder, double click on the Setup.exe icon.
 - f) The screen will be filled with a PM-1 Client background and a smaller window with the title "Welcome to PM-1 Client 6.0" will appear. Click on the Next button to proceed to the next step.
 - g) The next window will contain the licensing agreement. Click on Yes to accept the agreement and proceed.
 - h) After all of the files are copied, a window with the title "Setup Complete" will appear. Click on the Finish button to end.
 - i) A PM-1 Client icon will now be installed on the desktop.
3. To install the PM-1 Server:
 - a) On the desktop, click on the Start button, and then select Run from the resulting menu.
 - b) When the Run window appears select the Browse... button.
 - c) From the Browse Window, select the Removable drive that contains the installation disk
 - d) Click on the Server folder.

- e) From within the Server folder, double click on the Setup.exe icon
- f) A window with the title “Run Window” will appear. Click on the Okay button to proceed to the next step.
- g) The screen will then be filled with a PM-1 Server background and a window with the title of “Welcome to PM-1 Server 6.0” will appear. Click the Next button to proceed.
- j) The next window will contain the licensing agreement. Click on Yes to accept the agreement and proceed.
- h) Next a window will show the completion status as the files are copied. When the copying is complete click on the Finish button to finish the installation.
- i) A PM-1 Server icon will be installed on the desktop.

Script setup

The final step is to retrieve the new database setup scripts from the CD. Copy the contents of the *database* folder of the CD to *D:\pm1_db\scripts*, overwriting all files of the same names.

After copying the scripts, if it is desired to place shortcuts to the command verifier modification routines on the desktop, do so as follows. The three routines are *ADD_CMD_VERIFIER.bat*, *MODIFY_CMD_VERIFIER.bat*, and *DELETE_CMD_VERIFIER.bat*. For each shortcut desired, right-click and drag the file name to the desktop, then release the mouse. Click on “*Create shortcut here*” in the pop-up menu that appears.

Remote Database Connection Setup

The MPS/Aqua simulator may now be run on a PC separate from the Oracle database server. To use this capability, Oracle must be installed on both computers and an alias for the remote server must be created on the PC where the simulator will run. This alias is called a Service Name. To create a Service Name, do the following:

1. Bring up SQL*Plus on the PC containing the Oracle database and type “SELECT NAME FROM V\$DATABASE;”. The last line of the resulting output will be the database name. You will need this name when performing step 7 below.

All remaining steps are performed on the PC where the simulator will run.

2. Start the Net8 Assistant by selecting **Start -> Programs -> Oracle -> Network Admin -> Net8 Assistant**. (The exact path may be different.)
3. Click the **Net Service Names** folder then select the *green* “+” in the upper left-hand corner to add a service.
4. The first panel prompts for a **Service Name**. It is just an alias so enter something short and meaningful then select Next.

5. Make sure **TCP/IP** (Internet Protocol) is highlighted and then select Next.
6. Enter the IP address of the remote database server in **Host Name** field, accept the default Port Number (1521), then select Next.
7. Select the *Oracle 8I release 8.0 or previous* radio button. Enter the name of the default database on the remote server in the **Oracle SID** field, then select Next.
8. Do **NOT** select **Test**. Click on **Finish**. You should see your new Service Name (with *.world* appended to it) under the **Net Service Names** folder.
9. Select **File -> Save Network Configuration**.
10. To test the connection, bring up SQL*Plus and attempt to connect to the remote server by entering your new service name in the **Host String** field (don't enter the *.world*). Enter the usual **User Name** and **Password**.

Database Setup

The Aqua simulator has been modified to select one version of the PDB from multiple versions loaded into the Oracle database. This new capability has required changes to the PDB loading procedures as well as to database initialization during simulator startup. The new PDB ingest procedures are covered in this section. Selection of a PDB version during simulator startup is covered in Attachment D.

The database schema from Release 6.0-Beta and earlier is no longer valid. Also, the PDB ingest script used is different depending upon whether the initial version of the PDB is being loaded or subsequent versions are being added.

The BUILDPM1.BAT file has been modified to create the new database structure and load the first PDB. This script drops the old tables, creates the new ones, and loads the first version of the PDB. To load additional versions, you must execute the script, LOAD_NEXT_PDB.bat. To delete a version, run the script, DELETE_A_VERSION.bat.

The database ingest scripts look for the PDB files in *D:\pm1_db\pdb_data*. The files must have generic names (i.e *tlm_desc.pdb*, not *tlm_desc_050100.pdb*). Therefore they must be renamed prior to use.

The PDB files needed by the MPS/Aqua simulator are *cmd_desc.pdb*, *cmd_fixdata.pdb*, *cmd_parm.pdb*, *cmd_vardata.pdb*, *cmd_verify.pdb*, *tlm_calcurve.pdb*, *tlm_desc.pdb*, *tlm_dstate.pdb*, *tlm_packet.pdb*, *tlm_parm.pdb*, and *tlm_polyconv.pdb*.

Prior to each PDB download, create a folder under *D:\pm1_db\pdb_data* for the version being downloaded. It is recommended that the folder be named after the version and the files be downloaded to this folder. After the download, rename the PDB files so that they can be copied directly up to *D:\pm1_db\pdb_data*. This approach keeps the version's files available in case reloading is required.

Instructions for Downloading a PDB

- Using Explorer, log onto Toronto as an FTP site. The URL is <ftp://198.118.192.20>.

The directory path for the PDB should be supplied externally.

- Retrieve the 11 PDB files and store them in a subfolder to the *D:\pm1_db\pdb_data* folder.
- Truncate the names of the files by removing the date string. This string is something like “_060100”.
- Copy the files to the *D:\pm1_db\pdb_data* folder and follow the instructions for ingesting them into the Oracle database.

The new database is now fully loaded and configured. Examine each of the .LOG files in the *scripts* folder. The count of “Rows successfully loaded” in each should match the number of “Total logical records read”. A mismatch indicates that some records of the corresponding PDB file were rejected. It will be necessary to determine whether those records are rejected for legitimate reasons. For example, currently three records of the *tlm_packet* PDB file are discarded because they are GBAD packets with VCID 3. It is suggested that you check the *scripts* folder for the presence of .BAD files, which would indicate problems with the database flat files that the SQL scripts could not handle.

Instructions for ingesting the initial PDB version

Use these directions to set up the database schema and load the initial PDB version into the Oracle database.

1. Download the desired version of the PDB from the FTP web site. After the download you should have a complete set of generically named PDB files in the *D:\pm1_db\pdb_data* folder.
2. Using either Windows Explorer or My Computer, navigate to the *D:\pm1_db_scripts* folder and run **BUILDPM1.bat** by double-clicking on the filename.

Shortly after the script is started, **you will be prompted for the name of the new version** being ingested. This name must be **unique** and is used by the simulator to input the desired PDB version during initialization. The name may be up to a maximum of 9 alphanumeric characters. It is suggested that all versions begin with a date (eg 060100), followed by an optional revision number. This script will generate a lot of output to the screen, but the entire process takes less than 3 minutes.

Instructions for ingesting additional PDB versions

Use these directions to add additional PDB versions to the Oracle database after the original version has been ingested.

1. Create a folder at *D:\pm1_db\pdb_data* for the new version as described above. Then download the files from the FTP web site and rename them generically.
2. Delete the old PDB files *from D:\pm1_db\pdb_data* and copy the new files up to this directory.
3. Using either Windows Explorer or My Computer, navigate to the *D:\pm1_db_scripts* folder and run **LOAD_NEXT_PDB.bat** by double-clicking on its filename.

Shortly after the script starts, a list of the existing versions will be displayed to advise you of version names already in use. **You will be prompted for the name of the new version** to be ingested. This name must be unique. Enter a name as described above. This script will generate a lot of output to the screen, but the entire process takes less than 3 minutes.

Instructions for deleting a PDB version

Using either Windows Explorer or My Computer, navigate to the *D:\pm1_db_scripts* folder and run **DELETE_A_VERSION.bat**. A list of the existing versions will be displayed and you will be prompted for the name of the version to be deleted. Enter a version name and hit <CR>.

Attachment D - Special Operating Instructions

This attachment contains new special operating instructions for the final version of MPS/Aqua Release 6.0. All of the special operating instructions provided with the Beta delivery of Release 6.0 still apply. The information presented in this section, and with the Release 6.0 Beta delivery, has been checked for accuracy by the independent test team.

The User's Guide is being updated to include the information presented in this section and in the Special Operating Instructions for the Beta delivery. When completed, the updated User's Guide will be available from the ETS home page at <http://esdis-it.gsfc.nasa.gov/ETS/ets.html>.

Keyboard Shortcuts are now effective

While entering data into field(s) of most windows, you may now use the Tab key, and Shift-Tab key combination, to navigate between fields. When data entry is complete, you may use the Tab key to navigate to the *Apply* button, then press the Enter key to cause the simulator to act on your entries.

Selection of a PDB Version

With Release 6.0, the MPS/Aqua simulator is capable of selecting from multiple versions of the Aqua PDB in the Oracle database. During simulator initialization, when loading the database you may either enter a version identifier in the *Version* field of the *Load Database* window, or leave it blank to default to the most recent PDB version ingested into the Oracle database. The PDB version identifier is a one-to-nine character text string. There are three points to note:

- To select a version other than the default, you must know the version identifier. Version identifiers should be supplied to you by the system administrator. Optionally, you may determine the versions available by invoking SQL*Plus, with the same login and password as used during MPS initialization, and entering the query

*select * from versions;*

at the prompt. The semicolon at the end of the query is required syntax.

- The default PDB is the latest one loaded. It will be the last version identifier displayed by SQL*Plus in response to the query. This is not necessarily the newest PDB. Check with your system administrator to find out which version is the default.

- All SQL*Plus queries, except for the one given above and table description requests, must now include the phrase “*where version='cc..cc'* “, where cc..cc is the identifier of the desired PDB version. If you omit this phrase you will receive information about all versions that are present in the database.

Remote Database Connection

The MPS/Aqua simulator can now run on a PC separate from the Oracle database server. To use this capability, an alias for the remote server must be created. This alias is known as a Service Name. Additionally, Oracle 8i must be installed on both PCs. Contact your system administrator, or person responsible for installing PDB versions, to determine the Service Name of the PC where the PDB is installed.

To use this capability, enter the Service Name in the *Host* field of the *Load Database* window during simulator initialization. Leaving this field blank causes the simulator to load the PDB from the local PC.

This capability affords the following advantages:

- PDB version control is simpler. It is only necessary to load the PDB on one PC in a facility, such as Building 32, where multiple PCs running the simulator are present.
- Alternatively, it is possible to make modifications to a given version of the PDB on one PC, but not on other PCs. Thus it is possible to have special purpose PDB versions. See the instructions for modifying end-item verifiers in a later section of this attachment for one way of creating special purpose PDB versions.

There is one known disadvantage of remote PDB access. Command identification performs dynamic PDB access. Therefore it is slightly, but noticeably, slower than if the PDB is on the same PC.

Command Load Copying

The data portion of Command Loads is now automatically copied to the Spacecraft Memory Dump buffer. If the load contains multiple segments, only the first segment is copied. Event log messages are output to inform the operator of the load address and number of words copied.

It is no longer necessary to use *SetBuffer* directives to load the Spacecraft Memory Dump buffer. It is still necessary to start the dump process by either (1) filling in fields of the *Dump Initiation* window, (2) entering directives, or (3) executing a scenario script. If the load address and word count may be determined in advance, it is possible to build the scenario script before sending the load command(s).

The automatic copy of command load data to the dump buffer may be disabled. To do so enter the following directive to the SCPM1 module:

```
set CmdLoadCopyToDump 0
```

Command Load Checksum Processing

The simulator now calculates the checksum of command loads and compares its calculation to the checksum included in the command load buffer. It displays the calculated checksum and an indication as to whether it agreed with the received checksum in the event log area.

Checksum calculation may be disabled by entering the following directive to the SCPM1 module:

```
set CmdLoadValidChecksum 0
```

Generic Buffer Display

There are a number of data buffers within the SCPM1 module that do not have GUI displays. Among these are the Spacecraft Memory Dump buffer and several command buffers. The Generic Container Buffer display is a new capability provided with Release 6.0 to allow the user to view these buffers. A list of viewable SCPM1 buffers may be found in the SCPM1 chapter of the User's Guide.

To activate the Generic Container Buffer display, click on the Telemetry button of the SCPM1 module main control window, then select the *Display Container Buffer...* option. Enter the buffer name in the *Buffername* entry field and click on *Apply*. The defaults are to display 256 bytes of data from the beginning of the buffer.

The *Offset* field allows the user to select a starting point for display other than the beginning of the buffer.

The *Count* field allows the user to select the number of data quantities to display.

The *Size* dropdown menu allows the user to specify whether bytes, words, or double words are to be fetched from the buffer for display. For example, if the Size is set to Bytes and the Count is 256, then 256 bytes of data will be displayed. If the Size is changed to Word, then 256 16-bit words of data will be displayed.

The Generic Container Buffer display is limited to 1400 bytes of data (= 700 words, or 350 double words). A request for more data than that will result in a display of 1400 bytes of information.

Multiple Displays of the Container Item Window

With Release 6.0 the user may invoke the *Display/Set Container Items...* display multiple times, displaying different items in each window. When closed, the Container Item display window no longer preserves its contents for the next time it is opened.

There is one limitation with the current implementation. If a container item name is entered into multiple displays, updates will only be reflected in one of the displays.

User modification of the Command Verification PDB file

The MPS/Aqua simulator now provides the capability to add, modify and delete Command Verifier records. These new functions are implemented via SQL*Plus scripts that are called from batch files. There is a separate script and batch file for each function. The scripts prompt the user for the data items needed and then execute the desired action.

Warning
The SQL*Plus scripts don't perform any validation on the data entered and SQL*Plus does not provide any decision logic. Therefore, there is no way to rollback a transaction. The only way to correct mistakes is to run appropriate scripts to delete and/or add records.

General Notes:

- Strings (e.g. mnemonic, etc.) are case sensitive.
- You must enter a valid version designator. It is not possible to create a new PDB version using these facilities.

ADDING A NEW COMMAND VERIFIER

The function, ADD_CMD_VERIFIER, will add a new telemetry point to an existing command verifier, or add a completely new command verifier.

If a shortcut has been provided on the desktop, double-click on that to access the function. Otherwise, use either Windows Explorer or My Computer to navigate to the *D:\pm1_db\scripts* folder and double-click on the **ADD_CMD_VERIFIER.bat** filename.

When prompted, enter the desired values for the new record.

Enter a version from the list of versions displayed.
Hit ENTER to view the new record.
Hit ENTER to exit.

Notes:

- A Command Parameter Specification record must exist for the Command Verifier mnemonic specified and a Telemetry Description record must exist for the CEV mnemonic specified. Otherwise, the simulator will not be able to resolve the record.
- If a record added accidentally has incorrect data values, delete it (see below) and recreate the record with the correct values.

MODIFYING A COMMAND VERIFIER

The function, **MODIFY_CMD_VERIFIER**, will modify the CEV Low Value and CEV State of an existing Command Verifier record

If a shortcut has been provided on the desktop, double-click on that to access the function. Otherwise, use either Windows Explorer or My Computer to navigate to the *D:\pm1_db\scripts* folder and double-click on the **MODIFY_CMD_VERIFIER.bat** filename.

When prompted, enter the mnemonic of the Command Verifier to be modified.
Enter a version from the list of versions displayed.
Enter a telemetry mnemonic selected from the list of records displayed.
Enter a new CEV Low Value and CEV State Text when prompted.
Hit ENTER to exit.

Notes:

- You must enter both the CEV Low Value and State Text, even if only one field is to be modified.
- Only the CEV low value and State Text can be modified. To modify other fields, you must delete the record and add it again with the desired changes.
- If a record is modified with an incorrect value, run the script again and modify the value to the correct value.

DELETING A COMMAND VERIFIER

This function removes one, and only one, Command Verifier record from the database.

If a shortcut has been provided on the desktop, double-click on that to access the function. Otherwise, use either Windows Explorer or My Computer to navigate to the *D:\pm1_db\scripts* folder and double-click on the **DELETE_CMD_VERIFIER.bat** filename.

When prompted, enter the mnemonic of the Command Verifier to be deleted.
Enter a version from the list of versions displayed.
Enter the telemetry mnemonic of the record to be deleted.
Hit ENTER to exit

Notes:

You must enter a new record to restore a deleted record.

Command Data Block Header Validation

The MPS/Aqua simulator now validates the contents of certain fields of Command Data Block (CDB) Ground Message Headers (GMH) of received commands. The specific fields validated and the default expected values are described in the following table. There is no GUI screen to support this function. All entry must take place via either the directive entry line or via scenario script.

GMH Field Name	Size	Container Name	Expected Value
Message Type	1 byte	GSCmdExpectedMsgType	3
Source	1 byte	GSCmdExpectedSource	4
Destination	1 byte	GSCmdExpectedDestination	1
Sequence Count	2 bytes	GSCmdSequenceCount	*
Spacecraft ID	2 bytes	GSCmdExpectedSCID	9A

* If the sequence count is out of sync, the user will be notified and the expected count will be set to the count from the GMH plus one.

To disable Ground Message Header validation, send the following directive to the **GSPM1** module:

```
set GSCmdEnableHeaderValidation 0
```

If it is desired to make numerous changes over a short period of time, connect a scenario module to the GSPM1 module and write a scenario script. The link connection is channel 1 to channel 1.

TxFile Usage

TxFile is a new module the purpose of which is to allow transmission over an IP interface of telemetry or commands from disk files. TxFile can read and transmit files with fixed sized blocks of data, or files with variable sized data blocks provided that each data block has a header conforming to the format created by the log module.

Note that not all of the functions visible in the TxFile GUI screen work as yet. Only the capabilities described in the following paragraphs have been completely coded and tested.

There is one known restriction with the use of TxFile.
Neither filenames nor the directory path may contain spaces.

To use TxFile, create a project containing it and one output IP module. Connect the two modules by drawing an arrow from TxFile to OutputIP. The link will be channel one to channel one. Perform the usual configuration setup to the OutputIP module (mode, UDP or IP address, port, etc.) TxFile requires no configuration setup.

After running the project, click on the interior of the TxFile module to access the Run-time menu. Select the “Send From File” option from the pop-up menu. Follow the directions in one of the following paragraphs to transmit either fixed or variable sized blocks of data.

Transmit fixed sized data blocks without headers

This mode of transmission may be used to send any data that is contained in blocks of a known, fixed size. The data blocks must not have a header.

Set up TxFile as follows:

1. Enter the filename, complete with directory path. As noted above, it may not contain spaces.
2. Enter the *Blocksize* as the number of bytes to send at each transmit operation.
3. Select the Output Mode. The working choices are “*Manual*” and “*Auto-Complete*”.
4. If the “*Auto-Complete*” mode is selected, then set the “*Interval*” to the desired number of milliseconds between successive block transmits. The default is two seconds.
5. Leave the File Read Mode at the default (*Manual*) and set the *Offset* equal to the *Blocksize* entered above.

6. Click the “*Apply*” button.
7. If you selected the “*Auto-Complete*” Output Mode, simply click the “*Send*” button and all data blocks of the file will be transmitted with the interval you selected.

Transmission may be stopped before all data is sent by clicking the “*Stop*” button. After that, clicking the “*Send*” button will cause transmission to resume where it left off. Clicking the “*Apply*” button will cause TxFile to revert to the beginning of the data file.

If, on the other hand, you selected the “*Manual*” output mode, you must click “*Load*”, followed by “*Send*” for every block of data to be transmitted. If you click “*Send*” multiple times without clicking “*Load*” the same data block will be resent each time. (This might be useful in a debugging session where it is desired to send the same data repeatedly to test the behavior of receiving software or hardware.)

Transmit fixed or variable sized data blocks with headers

This mode may be used to transmit files of fixed or variable sized data blocks at an operator-selected interval. Each data block must contain a 10 byte header with the byte length of the block occupying the last two bytes. Files created by the SIMSS Log module have this format when the “*Log With Header*” option is checked.

Set up TxFile as follows:

1. Enter the filename, complete with directory path.
2. Select the Output Mode. The working choices are “*Manual*” and “*Auto-Complete*”.
3. If the “*Auto-Complete*” mode is selected, then set the “*Interval*” to the desired number of milliseconds between successive block transmits. The default is two seconds.
4. Set the File Read Mode to “*Log file*”.
5. Click the “*Apply*” button.
6. If you selected the “*Auto-Complete*” Output Mode, simply click the “*Send*” button and all data blocks of the file will be transmitted with the interval you selected.

Transmission may be stopped, before all data is sent, by clicking the “*Stop*” button. After that, clicking the “*Send*” button will cause transmission to resume where it left off. Clicking the “*Apply*” button will cause TxFile to revert to the beginning of the data file.

If, on the other hand, you selected the “*Manual*” output mode, you must click “*Load*”,

followed by “*Send*” for every block of data to be transmitted. If you click “*Send*” multiple times without clicking “*Load*” the same data block will be resent each time.

Transmit fixed or variable sized data blocks using log file timing

In this mode TxFile will transmit the data with intervals between successive blocks that are identical to the intervals at which the file was recorded. The data blocks in the file must have headers with the exact format created by the SIMSS Log module when its “*Log With Header*” option is selected. That format is a 10 byte header where the first eight bytes contain the time the block was recorded and the last two bytes contain the byte length of the data. When “*Send*” is clicked, TxFile will transmit the first block of data immediately. Thereafter, as TxFile reads each block it will retrieve the time from the header and subtract the recorded time of the preceding block from it. This gives the amount of time for TxFile to wait before transmitting the data.

Set up TxFile as follows:

1. Enter the filename, complete with directory path.
2. Set the Output Mode to “*Auto-Complete*”. (Do not select “*Manual*”.)
3. Set the File Read Mode to “*Log file*” and select the “*Use log file timing*” option.
4. Click the “*Apply*” button.
5. Click the “*Send*” button and all data blocks of the file will be transmitted.

Transmission may be stopped, before all data is sent, by clicking the “*Stop*” button. After that, clicking the “*Send*” button will cause transmission to resume where it left off. Clicking the “*Apply*” button will cause TxFile to revert to the beginning of the data file.

Attachment E – Resolved Discrepancy Reports

The following Discrepancy Reports (DRs) and Change Requests (CRs) have been closed by and are being delivered with MPS/PM-1 Release 6.0. The DRs/CRs are listed in the table below, which provides the DR/CR Number, Status, Severity, and a short description. A full description of each DR/CR follows the summary table. Complete information on all DRs/CRs may be accessed via the Internet at address <http://iree.gsfc.nasa.gov/ddts/>.

Summary of Closed Discrepancy Reports

Critical (Severity 1)	Urgent (Severity 2)	Routine (Severity 3)	Change Requests	Total
1	6	3	2	12

Status Definitions

N – New

V – Assigned Verification

W – Withdrawn

A – Assigned Analysis

T – Tested

P – Postponed

R – Analysis Entered

C – Closed

X – Duplicate

ETS No.	SMO No.	Type	Severity	Version Fixed In	Description
ETS0365	SMOdr05957	DR	2	3.1	MPS clock drifting
ETS0374	SMOdr06203	DR	2	3.1	MPS handling of packet lengths
ETS0376	SMOdr06279	CR	2	4.0	Need to enhance MPS/PM-1 to properly handle instrument telemetry
ETS0388	SMOdr06603	DR	2	5.0	Database ingest problem
ETS0389	SMOdr06630	DR	3	5.0	Secondary Key edit
ETS0398	SMOdr07012	DR	2	6.0	Telemetry packet headers are being corrupted
ETS0399	SMOdr07013	DR	2	6.0	Simulator crashes upon command receipt
ETS0400	SMOdr07015	DR	3	6.0	APID 1000 not being populated with valid times
ETS0401	SMOdr07036	DR	3	6.0	Packet interval changes are not smooth
ETS0402	SMOdr07127	CR	3	6.0	Synchronize copies of the VCDU Counter
ETS0403	SMOdr07137	DR	2	6.0	Cannot make changes to packet headers
ETS0407	SMOdr08005	DR	1	6.0	MPS crash when loading the TRW DB 082200

DR: SMODr05957 (ETS0365) Related NCR: Submitted: 991221
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000117

Title: MPS clock drifting

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 2.2
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 2
Date found: 991217
Location: Denver
Submitter: Vince Ruland
Organization: ECS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 991221 by vruland) *****

The spacecraft time being output by the sim is drifting, in addition to being off by two days. In one 4 hour period we observed the clock to lag by 20 minutes. This drift is repeatable, but not necessarily predictable. On another occasion we saw the clock actually drift ahead before falling behind actual time.

DR: SMODr06203 (ETS0374) Related NCR: Submitted: 000118
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000128

Title: MPS handling of packet lengths

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 3.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 2
Date found: 000114
Location: Denver
Submitter: Vince Ruland
Organization: EMOS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 000118 by vruland) *****

The PM-MPS needs to be changed so that when it uses the MIN_PKT_LENGTH and MAX_PKT_LENGTH fields from TLMPACKET.pdb it interprets these as being the min and max lengths of the data zone minus one for the corresponding APID. Currently the MPS interprets these as being the entire data zone.

***** Admin Comment (Added 000128 by eshurie) *****

Per developer at 01/28/2000 DRB meeting, this fix will be included in Release 3.1, planned for delivery today.

DR: SMODr06279 (ETS0376) Related NCR: Submitted: 000128
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000131

Title: Need to enhance MPS/PM-1 to properly handle instrument telemetry

SUBMITTAL INFORMATION

ANALYSIS INFORMATION

Project:	ETS	Assignee1/Org:	Ernest Quintin
Rel/Ver:	3.0	Phone:	301-805-3649
Subsystem:	MPS-PM/Aqua	Email:	equintin@csc.com
Test Phase:	dev informal integ	Assignee2/Org:	
Severity:	2	Phone:	
Date found:	000112	Email:	
Location:	GSFC	Date due (Sev=1,2):	
Submitter:	Ernest Quintin		
Organization:	ETS Dev Group		
Phone number:	301-805-3649		
Email:	equintin@csc.com		

***** Problem (Added 000128 by equintin) *****

The MPS/PM-1 simulator needs to be enhanced to properly handle instrument telemetry. Instrument telemetry generation aboard the PM-1 spacecraft is described by a secondary key as well as APID. The secondary key governs which telemetry parameters appear in a given instance of the APID.

An email from Ernest Quintin to Estelle Noone, et al, dated 1/13/2000, titled "Synopsis of Telecon with Raytheon on 1/12/00" provides all known details.

***** Admin Comment (Added 000131 by eshurie) *****

At 01/28/2000 DRB meeting, this Change Request was approved for Analysis, at Severity Level 2, in advance of its (same-day) submittal.

DR: SMODr06603 (ETS0388) Related NCR: Submitted: 000328
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000331

Title: Database ingest problem

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 4.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 2
Date found: 000327
Location: Denver
Submitter: Vince Ruland
Organization: EMOS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Admin Comment (Added 000331 by eshurie) *****

Per 3/31/00 DRB meeting, this DR was accepted as a Severity 2 instead of 1 since there is a workaround.

***** Problem (Modified 000331 by eshurie) *****

The 4.0 version of the SIMSS software will not properly ingest the 3/17 TRW database. This problem is severe and has nearly stopped testing of EMOS software.

DR: SMODr06630 (ETS0389) Related NCR: Submitted: 000404
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000414

Title: Secondary Key edit

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 4.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 000330
Location: Denver
Submitter: Vince Ruland
Organization: EMOS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 000404 by vruland) *****

Please describe the problem you are experiencing below, including what you did, what you expected to happen, and what actually happened:

When using the Display Packet window from the SC modules control window, changing the value fo the secondary key doesn't ungray the Apply button. Another box must be modified before one can apply the changes.

This button should ungray itself when there is a change to any of the boxes on the Display Packet window.

***** Admin Comment (Added 000414 by eshurie) *****

4/14/00 Per E. Quintin, a fix is planned for this in Release 5.0.

DR: SMODr07012 (ETS0398) Related NCR: Submitted: 000525
Status: TESTED Class: ETS Tested: 000707

Title: Telemetry packet headers are being corrupted

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: acceptance test
Severity: 2
Date found: 000516
Location: GSFC
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):
Summary:
Affects:
Related CCR #:
Date completed:
Projected Del/Rel:

VERIFICATION INFORMATION

Tester: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Date Verified: 000622
Version tested: 5.1
Test Status: Pending

***** Problem (Added 000525 by equintin) *****
Noticed occasional corruption of the primary header of
telemetry packets. Appears to be telemetry data overwriting
fields of the header.

***** Admin Comment (Modified 000623 by eshurie) *****
6/23/00 DRB: This fix was delivered with the 5.1 release.
Approved for the Test-Pending state.

Per developer at 5/26 DRB meeting, the fix for this has been made
and it will be included in the 5.1 release.

DR: SMOdr07013 (ETS0399) Related NCR: Submitted: 000525
Status: TESTED Class: ETS Tested: 000707

Title: Simulator crashes upon command receipt

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: acceptance test
Severity: 2
Date found: 000523
Location: GSFC
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):
Summary:
Affects:
Related CCR #:
Date completed:
Projected Del/Rel:

VERIFICATION INFORMATION

Tester: Elise A. Shurie
Phone: 301-805-3649
Email: equintin@csc.com
Date Verified: 000622
Version tested: 5.1
Test Status: Pending

***** Problem (Added 000525 by equintin) *****
The server crashes after receiving and decoding a spacecraft command. Appears to be a result of type AD commands but not type BC commands.

***** Admin Comment (Modified 000707 by eshurie) *****
6/23/00 DRB: Fix for this included in 5.1. (Passed internal testing) Approved to be moved to the Tested-pending state.

Per developer at 5/26 DRB meeting, the cause for this has been identified, and the fix will be included in the next release - 5.1.

DR: SMODr07015 (ETS0400) Related NCR: Submitted: 000525
Status: TESTED Class: ETS Tested: 000707

Title: APID 1000 not being populated with valid times

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 000524
Location: Denver
Submitter: Vince Ruland
Organization: EMOS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):
Summary:
Affects:
Related CCR #:
Date completed:
Projected Del/Rel:

VERIFICATION INFORMATION

Tester: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Date Verified: 000622
Version tested: 5.1
Test Status: Pending

***** Problem (Added 000525 by vruland) *****

Please describe the problem you are experiencing below, including what you did, what you expected to happen, and what actually happened:

APID 1000 is not being populated with valid times, analysis of what it is being populated with is not complete yet but it is not the spacecraft time that is being populated in secondary headers or other system times (EDOS svc headers for instance)

***** Admin Comment (Modified 000707 by eshurie) *****

6/23/00 DRB: The fix for this was delivered with the 5.1 release.
Moved to the Test-Pending state.

Per DRB decision 5/26/00, patch release 5.1 will be held up in order to include the fix for this. Release projected for 5/31, now probably 6/2.

DR: SMODr07036 (ETS0401) Related NCR: Submitted: 000602
Status: TESTED Class: ETS Tested: 000707

Title: Packet interval changes are not smooth.

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: acceptance test
Severity: 3
Date found: 000601
Location: GSFC
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):
Summary:
Affects:
Related CCR #:
Date completed:
Projected Del/Rel:

VERIFICATION INFORMATION

Tester: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Date Verified: 000622
Version tested: 5.1
Test Status: Pending

***** Problem (Added 000602 by equintin) *****

Changes to APID transmission intervals that reduce the interval do not take affect until the current wait has expired. In addition when the new interval takes affect, a burst of packets is transmitted before the simulator settles down to the new rate.

***** Admin Comment (Modified 000707 by eshurie) *****

6/23/00 DRB: This fix was delivered with the 5.1 release.
Approved by DRB for the Tested-Pending state.

6/9/00 DRB meeting: Per developer, this fix will be included in Release 5.1, but may hold it up a bit.

DR: SMODr07127 (ETS0402) Related NCR: Submitted: 000608
Status: TESTED Class: ETS Tested: 000707

Title: Synchronize copies of the VCDU Counter

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: in-field use
Severity: 3
Date found: 000605
Location: GSFC
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):
Summary:
Affects:
Related CCR #:
Date completed:
Projected Del/Rel:

VERIFICATION INFORMATION

Tester: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Date Verified: 000622
Version tested: 5.1
Test Status: Pending

***** Problem (Added 000608 by equintin) *****
When in IP mode, the MPS/Aqua simulator needs to synchronize the VCDU count field in APID 1000 with the counter in the Enhanced CLCW packet. When in serial mode, the simulator needs to synchronize the VCDU count field of APID 1000 with the counter value of the containing VCDU.

***** Admin Comment (Modified 000707 by eshurie) *****
6/23/00 DRB: This fix was delivered with the 5.1 release.
Approved by DRB for the Tested-Pending state.

6/9/00 DRB meeting: Per developer, this enhancement will be included in the next patch release, 5.1.

DR: SMODr07137 (ETS0403) Related NCR: Submitted: 000613
Status: TESTED Class: ETS Tested: 000707

Title: Cannot make changes to packet headers

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: in-field use
Severity: 2
Date found: 000607
Location: Denver
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):
Summary:
Affects:
Related CCR #:
Date completed:
Projected Del/Rel:

VERIFICATION INFORMATION

Tester: Elise A. Shurie
Phone: 301-805-3649
Email: equintin@csc.com
Date Verified: 000622
Version tested: 5.1
Test Status: Pending

***** Problem (Added 000613 by equintin) *****
Changes made to packet header fields using the Modify TLM Packet
Header window do not get propagated to the telemetry packets.
The same is true of the Modify EDU window.

***** Admin Comment (Modified 000707 by eshurie) *****
6/23/00 DRB: This fix was delivered with the 5.1 release.
Approved for the Test-Pending state.

DR: SMOdr08005 (ETS0407) Related NCR: Submitted: 000913
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000928

Title: MPS crash when loading the TRW DB 082200

SUBMITTAL INFORMATION

Project: ETS
DR Type: Problem
Rel/Ver: 6.0 Beta
Subsystem: MPS-PM/Aqua
Module: Simulator
Affected-Requirement:
Test Phase: unit test
Severity: 1
Date found: 000907
Location: Denver
Submitter: George McCone
Organization: EMOS
Phone number: 720-895-4150
Email: gcmccone@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 000913 by gmccone) *****

After running the DB through the Oracle Ingest Scripts, we tried loading the new ingested DB into the MPS. The Event Log showed that the MPS was pulling in the files, but after the Event log showed that it had pulled in ~9000 telemetry points the MPS crashed. This is very repeatable with the TRW DB 082200.

***** Admin Comment (Added 000928 by eshurie) *****

This DR was discussed at the 9/15 meeting, and since it was already being worked, should actually have been moved to the Analysis state at that time.

***** History *****

batchbug 000913 133728 Submitted to ETS by gmccone
batchbug 000913 133728 Enclosure "Problem" added by gmccone
batchbug 000928 152752 Enclosure "Admin Comment" added by eshurie
batchbug 000928 152903 N -> A (Assigned to Ernest Quintin) by eshurie

Attachment F – Unresolved Discrepancy Reports

All open MPS-PM/Aqua Discrepancy Reports (DRs) and Change Requests (CRs) are listed in the following table. The table includes the DR/CR Number, Status, Severity, and a short description. A full description of each DR/CR follows the summary table. Complete information on all DRs/CRs may be accessed via the Internet at <http://iree.gsfc.nasa.gov/ddts/>.

Summary of Open Discrepancy Reports

Critical (Severity 1)	Urgent (Severity 2)	Routine (Severity 3)	Change Request (CR)	Total
0	3	5	2	10

Status Definitions

N – New

V - Assigned Verification

W – Withdrawn

A - Assigned Analysis

T – Tested

P – Postponed

R - Analysis Entered

C – Closed

X – Duplicate

ETS #	SMO No.	Type	Severity	Status	Description
ETS0338	SMOdr05701	CR	3	A	PM MPS sim window management
ETS0343	SMOdr05706	CR	3	A	removing links
ETS0363	SMOdr05924	DR	3	A	Telemetry data values entered by operator are not validated
ETS0378	SMOdr06292	DR	3	A	Packet Sequence count anomaly
ETS0379	SMOdr06294	DR	2	A	Cannot use two output modules for same output
ETS0392	SMOdr06633	DR	3	A	Loading database
ETS0404	SMOdr07237	DR	3	A	Unable to Set tlm >32bits in size
ETS0406	SMOdr07803	DR	3	N	MPS Scenario Execution from Command Subfields
ETS0409	SMOdr08087	DR	2	N	Dump packets are not transmitted in serial mode
ETS0410	SMDdr08088	DR	2	N	Secondary header flag not set in memory dump packets

DR: SMODR05701 (ETS0338) Related NCR: Submitted: 991103
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 991217

Title: PM MPS sim window management

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 2.1
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 991101
Location: Denver
Submitter: Vince Ruland
Organization: ETS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 991103 by vruland) *****

Any window brought up or opened will disappear behind the main project screen as soon as it's clicked on. In order to have access to these windows, we have to ensure that a portion of the windows are visible outside of the main screen so they can be clicked on. Suggest a better window management akin to a "start" menu bar in windows that allows the user to select any window at any time, whether it is buried under other windows or not.

***** Analysis Info (Added 991221 by eshurie) *****
Information provided by E. Noone 12/17/99:

Window management is controlled by Win NT. Clicking on the icon in the task bar (which is usually at the bottom of the screen) will get the window to pop to the front.

Initial indication is that no software change may be required.

DR: SMOdr05706 (ETS0343) Related NCR: Submitted: 991103
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 991109

Title: removing links

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 2.1
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 991029
Location: Denver
Submitter: Vince Ruland
Organization: ETS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 991103 by vruland) *****

There should be an easier way to remove an incorrect link or a link made in error rather than going into the design mode to delete it. After the link is deleted, the create links mode has to be re-entered in order to continue creating links.

***** Admin Comments (Added 991109 by eshurie) *****

Per DRB meeting (11/8/99), the developers stated that the changes needed for this enhancement will be very involved.

DR: SMOdr05924 (ETS0363) Related NCR: Submitted: 991217
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000117

Title: Telemetry data values entered by operator are not validated

SUBMITTAL INFORMATION	ANALYSIS INFORMATION
Project: ETS	Assignee1/Org: Ernest Quintin
Rel/Ver: 3.0	Phone: 301-805-3649
Subsystem: MPS-PM/Aqua	Email: equintin@csc.com
Test Phase: acceptance test	Assignee2/Org:
Severity: 3	Phone:
Date found: 991217	Email:
Location: GSFC	Date due (Sev=1,2):
Submitter: Ernest Quintin	
Organization: ETS Dev Group	
Phone number: 301-805-3649	
Email: equintin@csc.com	

***** Problem (Added 991217 by equintin) *****
No validation is being performed on the values entered in the Set Directive Window. If the value entered exceeds the number of bits specified for the telemetry point, high order bits are truncated when the packet is built. If you enter a hex value, the telemetry point gets set to zero. Binary values are interpreted as decimal. In addition, the system does not notify the user concerning the invalid entry

DR: SMOdr06292 (ETS0378) Related NCR: Submitted: 000131
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000202

Title: Packet Sequence count anomaly

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 3.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 000128
Location: Denver
Submitter: Vince Ruland
Organization: ECS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Modified 000202 by eshurie) *****

When an APID's sequence count is manually edited, the next packet output from the MPS simulator contains the edited number incremented by one instead of the number entered in the edit field.

***** Admin Comment (Modified 000202 by eshurie) *****

(At 01/28/2000 DRB meeting, this DR was approved for Analysis in advance of its imminent submittal to the DRTT.)

DR: SMOdr06294 (ETS0379) Related NCR: Submitted: 000131
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000215

Title: Cannot use two output modules for same output

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 3.0
Subsystem: MPS-PM/Aqua
Test Phase: IV&V
Severity: 2
Date found: 000128
Location: GSFC
Submitter: Hillary Shein
Organization: I&T
Phone number: 301-982-5414
Email: hshein@averstar.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 000131 by hshein) *****

I attempted to send duplicate telemetry to the PM EMOS system by configuring two output modules to transmit the telemetry stream coming from the simulator module.

When two output modules (with the same output stream) were present, neither output module transmitted data. When the second output module was removed, the original output module transmitted data as expected.

This does not cause a problem with two output modules in the "normal" configuration (one for telemetry and one for CLCW's).

DR: SMOdr06633 (ETS0392) Related NCR: Submitted: 000404
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000512

Title: Loading database

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 4.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 000331
Location: Denver
Submitter: Vince Ruland
Organization: EMOS
Phone number: 720-895-4068
Email: vhruland@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 000404 by vruland) *****

Please describe the problem you are experiencing below, including what you did, what you expected to happen, and what actually happened:

A user should be able to load a new version of the database into the SC module without having to cycle the entire project first.

Whenever the apply button is clicked for the Load Database on a SC module, the previous instance of the database should be purged before the module loads the new instance.

***** Admin Comment (Modified 000515 by eshurie) *****

At 5/12/00 DRB, the developer got more information on this request, and will write a memo assessing the difficulty of the different programming options.

Per DRB on 4/14/00, this DR is on HOLD pending further contemplation of it by Denver. (Would not be able to be done within a week.)

DR: SMOdr07237 (ETS0404) Related NCR: Submitted: 000623
Status: ASSIGNED-ANALYSIS Class: ETS Asgnd-Analysis: 000623

Title: Unable to Set tlm >32bits in size

SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 5.0
Subsystem: MPS-PM/Aqua
Test Phase: in-field use
Severity: 3
Date found: 000607
Location: Alaska
Submitter: George McCone
Organization: ECS
Phone number: 720-895-4150
Email: gcmccone@west.raytheon.com

ANALYSIS INFORMATION

Assignee1/Org: Ernest Quintin
Phone: 301-805-3649
Email: equintin@csc.com
Assignee2/Org:
Phone:
Email:
Date due (Sev=1,2):

***** Problem (Added 000623 by gmccone) *****

In the PM/MPS sim, we are unable to set the contents
of a TLM point that is greater than 32 bits in size
through the directive command line.

EMOS can handle TLM points up to 64 bits in size.

The Sim should be able to handle setting TLM points up
64 bits in size.

***** Admin Comment (Modified 000623 by eshurie) *****

6/23/00: This issue was brought up and discussed at the
6/9/00 DRB meeting. The DR was accepted that day, in advance
of it's creation, based on the promise that it would be
submitted to the drtt that day.

DR: SMOdr07803 (ETS0406) Related NCR: Submitted: 000821
Status: NEW Class: ETS Forwarded: 000821

Title: MPS Scenario Execution from Command Subfields
SUBMITTAL INFORMATION

Project: ETS
Rel/Ver: 6.0
Subsystem: MPS-PM/Aqua
Test Phase: unit test
Severity: 3
Date found: 000804
Location: GSFC
Submitter: Ed Weidner
Organization: Other
Phone number: (301)867-0023
Email: eweidner@qssmeds.com

***** Configuration (Added 000821 by eweidner) *****
MPS version 6.0 Beta

***** Admin Comment (Added 000821 by eshurie) *****
8/21/00: Per Carolyn Dent, this DR - Spcrrft_A0104 - is really an
ETS problem and will now be moved from Spacecraft in the drtt to
the ETS class in the drtt. (The spcrrft number will no longer exist)
Email dated 8/21/00 follows:

This appears to be an MPS not a IVVF problem. The problem
should be moved to the ETS with the Element MPS-Aqua or MPS.

Thanks, Carolyn

***** Problem (Modified 000821 by eshurie) *****
The MPS does not currently spawn scenarios from command subfields
(via command scenario file), only from the prime command mnemonic.
Since many commands require subfields to designate the prime
action (such as CERES mode commands for example), this greatly
limits the fidelity of the tool.

Note: This would also require the constraint of only allowing a
command to be listed once in the command scenario file to be
adjusted to either allow multiple times or recognize subfields as
well.

DR: SMOdr08087 (ETS0409)
Status: NEW

Related NCR:
Class: ETS

Submitted: 000928

Title: Dump packets are not transmitted in serial mode

SUBMITTAL INFORMATION

Project: ETS
DR Type: Problem
Rel/Ver: 6.0
Subsystem: MPS-PM/Aqua
Module: Simulator
Affected-Requirement:
Test Phase: acceptance test
Severity: 2
Date found: 000926
Location: GSFC
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

***** Problem (Added 000928 by equintin) *****
Attempted to trigger a spacecraft memory dump with the Aqua
simulator in serial output mode (CADU generation). The dump
packet(s) never appeared in the output CADU stream.

Repeated the test in IP mode and the packet(s) did appear in
the IP packet stream.

***** History *****

batchbug 000928 105303 Submitted to ETS by equintin
batchbug 000928 105303 Enclosure "Problem" added by equintin

DR: SMOdr08088 (ETS0410) Related NCR: Submitted: 000928
Status: NEW Class: ETS

Title: Secondary header flag not set in memory dump packets

SUBMITTAL INFORMATION

Project: ETS
DR Type: Problem
Rel/Ver: 6.0
Subsystem: MPS-PM/Aqua
Module: Simulator
Affected-Requirement:
Test Phase: acceptance test
Severity: 2
Date found: 000926
Location: GSFC
Submitter: Ernest Quintin
Organization: ETS Dev Group
Phone number: 301-805-3649
Email: equintin@csc.com

***** Problem (Added 000928 by equintin) *****
Created and logged a spacecraft memory dump using APID 930.
This is a GNCC dump which should have a secondary header.
Upon examining the log noted that the packets do have a proper
secondary header but the secondary header flag was not set
in the primary header.

***** History *****
batchbug 000928 105757 Submitted to ETS by equintin
batchbug 000928 105757 Enclosure "Problem" added by equintin

Attachment G – Requirements Matrix

Note: All MPS/Aqua requirements have been met with the delivery of Release 6.0, except for PMGEN-19.8 and the PMMDL (Modeling) requirements. The unmet requirements will be incorporated in a subsequent release, once the generic capabilities have been provided in the core SIMSS system.

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMCMD-01	1	The MPS/PM-1 simulator shall be capable of receiving command data as UDP command blocks.	SIMSS has been replaced by MPS in all requirement entries.
PMCMD-02	1	The MPS/PM-1 simulator shall be capable of configuring command receipt processing in IP mode.	
PMCMD-02.01	1	The MPS/PM-1 simulator shall be capable of configuring IP mode command receipt to UDP MULTICAST mode.	
PMCMD-02.02	1	The MPS/PM-1 simulator shall be capable of configuring IP mode command receipt to any valid UDP MULTICAST IP address.	
PMCMD-02.03	1	The MPS/PM-1 simulator shall be capable of configuring IP mode command receipt to any valid UDP MULTICAST Port number.	
PMCMD-02.04	1	The MPS/PM-1 simulator shall be capable of configuring IP mode command receipt to any block length between one and 6000 bytes.	
PMCMD-03	1	The MPS/PM-1 simulator shall accept operator directives that enable or disable the following elements of the command validation process: Codeblock BCH Parity Validation, Transfer Frame Header Validation, FARM Protocol Validation, and User Command Packet Header Validation.	
PMCMD-03.01	1	When the Codeblock BCH parity validation element is enabled, the command subsystem will verify for each codeblock of each received CLTU that the BCH parity byte matches a computed value and that the spare bit is equal to zero. If any codeblock of a CLTU fails validation, an event message will be generated and that entire CLTU will be discarded. When this element is disabled, the parity byte will be assumed to be valid.	
PMCMD-03.02	1	When the Transfer Frame Header validation element is enabled, the command subsystem will verify that all of the fields of the Transfer Frame header, except the sequence number, match expected values and ranges as defined in the ICD. If the Transfer Frame Header validation fails, an event message will be generated and the entire Transfer Frame will be discarded. If applicable, the CLCW corresponding to that Transfer Frame's virtual channel will be updated with error information. When this element is disabled, the Transfer Frame header values will be assumed to be valid.	
PMCMD-03.03	1	When the FARM validation element is enabled, the command subsystem will verify that the Transfer Frame sequence number is valid as expected for FARM-1 protocol as defined in the ICD. If the FARM validation fails, an event message will be generated and the entire Transfer Frame will be discarded. If applicable, the CLCW corresponding to that Transfer Frame's virtual channel will be updated with error information. When this element is disabled, the Transfer Frame sequence number will be assumed to be valid.	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMCMD-03.04	1	When the Command Packet Header validation element is enabled, the command subsystem will verify that the Command Packet Header fields contain valid values as defined in the ICD. If the Command Packet Header validation fails, an event message will be generated and the Command Packet will be discarded. This requirement is applicable to the spacecraft command packet format and the instrument command packet format. When this element is disabled, the Command Packet Header is assumed to be valid.	
PMCMD-04	2	The MPS/PM-1 simulator shall accept operator directives to change all fields of the spacecraft and instrument CLCWs.	
PMCMD-05	2	The MPS/PM-1 simulator shall simulate spacecraft command acceptance according to the COP-1 protocol.	
PMCMD-05.01	2	The MPS/PM-1 simulator shall perform Type AD spacecraft command acceptance checks in accordance with the FARM-1 protocol if FARM-1 protocol checking is enabled.	
PMCMD-05.01.1	2	The MPS/PM-1 simulator shall reject Type AD spacecraft commands and post a command rejected event message if the Lockout bit is set in the spacecraft CLCW.	
PMCMD-05.01.2	2	The MPS/PM-1 simulator shall reject Type AD spacecraft commands, post a command rejected message, and set the Lockout bit in the spacecraft CLCW if (1) the Frame Sequence Count in the Transfer Frame header is more than 90 counts greater than or more than 90 counts less than (modulo 256) the Report Value field of the spacecraft CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	
PMCMD-05.01.3	2	The MPS/PM-1 simulator shall reject Type AD spacecraft commands, post a command rejected message, and set the Retransmit bit in the spacecraft CLCW if (1) the Frame Sequence Count in the Transfer Frame header is between one and 90 counts greater than (modulo 256) the contents of the Report Value field of the spacecraft CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	
PMCMD-05.01.4	2	The MPS/PM-1 simulator shall reject Type AD spacecraft commands and post a command rejected message if (1) the Frame Sequence Count in the Transfer Frame header is between one and 90 counts less than (modulo 256) the contents of the Report Value field of the spacecraft CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	
PMCMD-05.01.5	2	The MPS/PM-1 simulator shall clear the spacecraft CLCW Lockout bit upon receipt of an UNLOCK Control Command (Type BC) containing the spacecraft VCID.	
PMCMD-05.01.6	2	The MPS/PM-1 simulator shall set the spacecraft CLCW Report Value field to the data value contained within the third byte of a SET V(R) Control Command (Type BC) containing the spacecraft VCID.	
PMCMD-05.01.7	2	The MPS/PM-1 simulator shall increment the Report Value field (modulo 256) of the spacecraft CLCW upon receipt of a Type AD spacecraft command whose Frame Sequence Count matches the current spacecraft CLCW Report Value field contents, provided that FARM-1 protocol checking is enabled.	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMCMD-05.02	2	The MPS/PM-1 simulator shall perform Type AD instrument command acceptance checks in accordance with the FARM-1 protocol if FARM-1 protocol checking is enabled.	
PMCMD-05.02.1	2	The MPS/PM-1 simulator shall reject Type AD instrument commands and post a command rejected event message if the Lockout bit is set in the instrument CLCW.	
PMCMD-05.02.2	2	The MPS/PM-1 simulator shall reject Type AD instrument commands, post a command rejected message, and set the Lockout bit in the instrument CLCW if (1) the Frame Sequence Count in the Transfer Frame header is more than 90 counts greater than or more than 90 counts less than (modulo 256) the Report Value field of the instrument CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	
PMCMD-05.02.3	2	The MPS/PM-1 simulator shall reject Type AD instrument commands, post a command rejected message, and set the Retransmit bit in the instrument CLCW, if (1) the Frame Sequence Count in the Transfer Frame header is between one and 90 counts greater than (modulo 256) the Report Value field of the instrument CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	
PMCMD-05.02.4	2	The MPS/PM-1 simulator shall reject Type AD instrument commands and post a command rejected message if (1) the Frame Sequence Count in the Transfer Frame header is between one and 90 counts less than (modulo 256) the Report Value field of the instrument CLCW <u>and</u> (2) FARM-1 protocol checking is enabled.	
PMCMD-05.02.5	2	The MPS/PM-1 simulator shall clear the instrument CLCW Lockout bit upon receipt of an UNLOCK Control Command (Type BC) containing the instrument VCID.	
PMCMD-05.02.6	2	The MPS/PM-1 simulator shall set the instrument CLCW Report Value field to the data value contained within the third byte of a SET V(R) Control Command (Type BC) containing the instrument VCID.	
PMCMD-05.02.7	2	The MPS/PM-1 simulator shall increment the Report Value field (modulo 256) of the instrument CLCW upon receipt of a Type AD instrument command whose Frame Sequence Count matches the current instrument CLCW Report Value field contents, providing that FARM-1 protocol checking is enabled.	
PMCMD-06	1	The MPS/PM-1 simulator shall provide the capability to monitor and display command processing status.	
PMCMD-07	1	Upon operator request, the MPS/PM-1 simulator shall store received commands for posttest review subject to specified storage capacities.	
PMCMD-08	3.1	The MPS/PM-1 simulator shall use information from the PDB to perform command identification processing. The Command subsystem shall match command bit patterns received to stored bit patterns to locate command mnemonics in the PDB.	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMCMD-09	4	The MPS/PM-1 simulator shall provide the capability to respond to that subset of spacecraft commands that are defined in the PM-1 PDB Command Execution Verification (CEV) file. If the PDB CEV file contains end-item verifier telemetry mnemonics associated with the identified command, the associated telemetry point(s) will be set to the corresponding value(s) defined in the CEV file.	
PMCMD-10	3.1	The MPS/PM-1 simulator shall generate a simulator event message whenever a command is received.	
PMCMD-10.01	3.1	The MPS/PM-1 simulator shall generate a simulator event message to display the command mnemonic whenever a valid command is decoded.	
PMCMD-10.02	3.1	The MPS/PM-1 simulator shall generate a simulator event message to display the values of command submnemonics whenever a command containing submnemonics is decoded.	
PMCMD-11	3.1	The MPS/PM-1 simulator shall generate a simulator event message whenever a command error is detected	
PMCMD-11.01	3.1	The MPS/PM-1 simulator shall generate a simulator event message indicating the command error detected whenever a command in error is decoded, provided that command validation is enabled.	
PMCMD-11.02	3.1	The MPS/PM-1 simulator shall generate an event message indicating that an unknown command has been received whenever a command cannot be matched to any PDB entry.	
PMCMD-12	6	The MPS/PM-1 simulator shall perform verification of selected fields of the Command Data Block (CDB) header of received commands. The fields to be verified shall be Message Type, Source, Destination, spacecraft identifier (SCID), and Sequence Count.	Requirement added with Release 6.
PMCMD-12.01	6	The MPS/PM-1 simulator shall generate event messages reporting inconsistencies in the verifiable fields of the CDB.	Requirement added with Release 6.
PMCMD-12.02	6	The MPS/PM-1 simulator shall execute operator directives that set expected values for verification of the Command Data Block (CDB) header.	Renumbered from PMCMD-12. Reworded slightly for accuracy.
PMCMD-12.03	6	The MPS/PM-1 simulator shall permit the operator to enable and disable CDB verification.	Requirement added with Release 6.
PMCMD-13	4P,5	The MPS/PM-1 simulator shall receive spacecraft memory and table loads via command blocks and shall store the load data in a load buffer (simulated spacecraft memory.)	Slightly reworded for Release 6.
PMCMD-13.01	6	The MPS/PM-1 simulator shall perform a validation of the command load data checksum, for those loads that contain a checksum.	Renumbered from PMCMD-14.
PMCMD-13.02	6	The MPS/PM-1 simulator shall permit the operator to inhibit the checksum validation.	Requirement added with Release 6.
PMCMD-14	6	The MPS/PM-1 simulator shall be capable of simulating a spacecraft memory dump of loaded data.	Requirement added with Release 6.
PMCMD-14.01	6	The MPS/PM-1 simulator shall be capable of copying a single memory load from the load buffer to the dump buffer.	Requirement added with Release 6.
PMCMD-14.02	6	The MPS/PM-1 simulator shall permit the operator to inhibit copying the memory load to the dump buffer.	Requirement added with Release 6.

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMCMD-15	6	The MPS/PM-1 simulator shall process commands that request or configure for a spacecraft memory dump.	Implemented via a combination of copy from command load buffer to dump buffer and operator directives that set up and enable dump APIDs.
PMCMD-16	1	The MPS/PM-1 simulator interface with EOC shall comply with the command interface formats and protocols specified in the EDOS to EGS Elements interface document	
PMCMD-17	5	The MPS/PM-1 simulator shall be capable of updating multiple command counters in telemetry. The command counters to be updated shall be as agreed upon with PM-1 project representatives.	
PMCMD-18	1	The MPS/PM-1 simulator shall interpret VCID 0 (spacecraft), VCID 1 (instrument), and VCID 16 and 17 (TIE critical) commands.	
PMCMD-19	6	The MPS/PM-1 simulator shall interpret multipart commands.	
PMCMD-20	1	The MPS/PM-1 simulator shall be capable of logging up to 8 MB of received commands during a testing session.	
PMCMD-21	4	The MPS/PM-1 simulator shall receive spacecraft commands in a CLTU bitstream through the serial interface at rates from 125 bps to 2 Kbps.	
PMGEN-01	1	The MPS/PM-1 simulator shall be Year 2000 compliant	
PMGEN-02	1	The MPS/PM-1 simulator GUI shall set the simulated spacecraft time as directed by the operator.	
PMGEN-03	4	The MPS/PM-1 simulator shall be capable of executing a scenario script file.	
PMGEN-03.01	4	The MPS/PM-1 simulator shall be capable of executing operator directives via a scenario script to update telemetry parameters by mnemonic.	
PMGEN-03.02	5	The MPS/PM-1 simulator shall be capable of executing operator directives via a scenario script to retrieve and display the value of any telemetry parameter by mnemonic.	
PMGEN-03.03	4	The MPS/PM-1 simulator shall be capable of executing operator directives via a scenario script to start and stop telemetry transmission.	
PMGEN-03.04	4	The MPS/PM-1 simulator shall be capable of executing operator directives via a scenario script to start and stop transmission of CLCW packets.	
PMGEN-03.05	4	The MPS/PM-1 simulator shall be capable of executing operator directives via a scenario script to enable and disable all elements of command validation that are under operator control. See “PMCMD” requirements for those command validation elements that are controllable by the operator.	
PMGEN-04	4	The MPS/PM-1 simulator shall be capable of providing files of received or generated test data on electronic and physical media.	
PMGEN-05	1	The MPS/PM-1 simulator GUI shall acknowledge an operator request within 2 seconds of its entry.	
PMGEN-06	1	The MPS/PM-1 simulator GUI shall start execution of an operator request within 5 seconds of its entry.	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMGEN-07	1	The MPS/PM-1 simulator shall be capable of maintaining an internal time code to a resolution of 125 milliseconds.	
PMGEN-08	1	The MPS/PM-1 simulator shall comply with the set of display guidelines specified in DSTL-92-007, Human-Computer Interface Guidelines, August, 1992.	
PMGEN-09	1	The MPS/PM-1 simulator shall comply with security provisions specified in the NASA Automated Information Security Handbook, NHB 2410.9A.	
PMGEN-10	1	The MPS/PM-1 simulator shall comply with the NASA Communications (Nascom) Access Protection Policy and Guidelines.	
PMGEN-11	1	The MPS/PM-1 simulator shall provide a hard disk drive with sufficient capacity to store the program bootstrap, executable files, and other simulation environment files, such as the Project Data Base and scenario files used during tests, and a TBD percent reserve.	
PMGEN-12	1	The MPS/PM-1 simulator shall provide a physical media storage device that can be used to support the exchange of small amounts of information with external systems and for system backups and data logging.	
PMGEN-13	1	The MPS/PM-1 simulator shall be portable.	
PMGEN-14	1	The MPS/PM-1 simulator shall provide an Ethernet interface that conforms to 10BaseT of the IEEE 802.3 standard.	
PMGEN-15	1	The MPS/PM-1 simulator shall interface with the EOC through the Ethernet interface using the Internet Protocol (IP) suite, including TCP/IP and UDP/IP.	
PMGEN-16	1	The MPS/PM-1 simulator shall receive CLTUs in command data blocks from the EOC and output EDUs (packets and CLCWs) to the EOC through the Ethernet interface. All data transfers through this Ethernet interface are based on UDP/IP protocol.	
PMGEN-17	6	The MPS/PM-1 simulator shall provide an offline utility to permit modification of the Command End-Item Verifiers file in the Oracle database.	Requirement added with Release 6.
PMGEN-17.01	6	The MPS/PM-1 simulator Command End-Item Verifiers modification utility shall permit the addition of a single record of the Oracle database end-item verifiers file at each invocation.	Requirement added with Release 6.
PMGEN-17.02	6	The MPS/PM-1 simulator Command End-Item Verifiers modification utility shall permit the modification of a single record of the Oracle database end-item verifiers file at each invocation. The Low Limit and State Text fields shall be the only fields that can be modified.	Requirement added with Release 6.
PMGEN-17.03	6	The MPS/PM-1 simulator Command End-Item Verifiers modification utility shall permit the deletion of a single record from the Oracle database end-item verifiers file at each invocation.	Requirement added with Release 6.
PMGEN-18	6	The MPS/PM-1 simulator shall provide a file selection browse capability.	Requirement added with Release 6.
PMGEN-19	3	The MPS/PM-1 simulator shall provide a configuration save and restore capability.	Requirement added with Release 6.

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMGEN-19.01	3	The MPS/PM-1 simulator shall be capable of saving module configuration information. The information saved shall consist of the modules that constitute a project, and the module links and link source/destination numbers.	Requirement added with Release 6.
PMGEN-19.02	3	The MPS/PM-1 simulator shall be capable of saving configuration information for IP modules, log modules, and Serial modules.	Requirement added with Release 6.
PMGEN-19.03	3	The MPS/PM-1 simulator shall be capable of saving multiple configurations in disk files.	Requirement added with Release 6.
PMGEN-19.04	3	The MPS/PM-1 simulator shall permit the operator to name a disk file in which configuration information shall be saved.	Requirement added with Release 6.
PMGEN-19.05	3	The MPS/PM-1 simulator shall permit the operator to restore configuration information upon initialization.	Requirement added with Release 6.
PMGEN-19.06	3	The MPS/PM-1 simulator shall be capable of restoring configuration information from an existing named disk file.	Requirement added with Release 6.
PMGEN-19.07	3	The MPS/PM-1 simulator shall be capable of displaying the names of the disk files when responding to a restore request during initialization.	Requirement added with Release 6.
PMGEN-19.08		The MPS/PM-1 simulator shall be capable of displaying the file creation date when responding to a restore request during initialization.	Not implemented. This would be a SIMSS function.
PMGEN-20	6	The MPS/PM-1 simulator shall be capable of executing multiple scenario script files simultaneously, up to the limit imposed by CPU and memory capacities.	Requirement added with Release 6.
PMGEN-20.01	6	The MPS/PM-1 simulator shall permit the operator full control of scenario script files that the operator has invoked. The control directives available shall consist of START, STOP, PAUSE, and RESUME.	Requirement added with Release 6.
PMGEN-20.02	6	The MPS/PM-1 simulator shall be capable of starting a scenario script in response to a command received. The operator shall not be able to STOP, PAUSE, or RESUME a scenario script started this way.	Requirement added with Release 6.
PMGEN-20.03	6	The MPS/PM-1 simulator shall be capable of invoking a scenario script from within a scenario script. The operator shall not be able to STOP, PAUSE, or RESUME a scenario script started this way.	Requirement added with Release 6.
PMGEN-20.04	6	The MPS/PM-1 simulator shall be capable of displaying the status of all scenario scripts that were started by the operator. This status shall consist of an indication as to whether the scenario script is running, paused, or finished, a display of the current line number, and a display of the directive currently being executed.	Requirement added with Release 6.
PMGUI-01	1	The MPS/PM-1 simulator shall accept and validate all operator directives.	
PMGUI-01.01	6	The MPS/PM-1 simulator GUI shall maintain a history list of directives entered by the operator. This history list shall store a maximum of 10 operator directives.	Requirement added with Release 6.

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMGUI-01.02	6	The MPS/PM-1 simulator GUI shall permit the operator to re-execute directives stored in the history list.	Requirement added with Release 6.
PMGUI-01.03	6	The MPS/PM-1 simulator GUI shall permit the operator to edit directives stored in the history list.	Requirement added with Release 6.
PMGUI-02	1	The MPS/PM-1 simulator GUI shall provide the capability to display command packets received.	
PMGUI-03	1	The MPS/PM-1 simulator GUI shall provide the capability to display telemetry and CLCW packets transmitted.	
PMGUI-04	1	The MPS/PM-1 simulator GUI shall provide the capability to display command and telemetry status.	
PMGUI-05	1	The MPS/PM-1 simulator GUI shall provide the capability to display the current receive and transmit network configuration to the operator.	
PMGUI-06	1	The MPS/PM-1 simulator shall accept and execute operator directives that set spacecraft time and GMT.	
PMGUI-07	1	The MPS/PM-1 simulator shall provide the capability to display the EDOS Service Header appended to transmitted telemetry packets.	
PMGUI-08	1	The MPS/PM-1 simulator shall provide the capability to display the Telemetry Packet Header of a selected APID.	
PMGUI-09	1	The MPS/PM-1 simulator shall provide the capability to display GMT and Spacecraft Times.	
PMGUI-10	2	The MPS/PM-1 simulator shall provide the capability to display the current values of the spacecraft and instrument CLCWs.	
PMGUI-11	1	The MPS/PM-1 simulator shall provide the capability to display event messages.	
PMGUI-12	1	The MPS/PM-1 simulator shall provide the capability to display telemetry and CLCW transmit status.	
PMGUI-13	1	The MPS/PM-1 simulator shall provide the capability to display command receipt status.	
PMGUI-14	1	The MPS/PM-1 simulator shall be capable of updating all displays periodically.	
PMGUI-15	6	The MPS/PM-1 simulator shall provide a generic buffer display.	
PM-INIT-01	6	The MPS/PM-1 simulator shall be capable of selecting a desired version of the PDB at operator request during initialization.	
PM-INIT-01.01	6	During initialization, the MPS/PM-1 simulator shall be capable of querying an Oracle database to determine which versions of the PM-1 PDB are available. The version information returned from the database shall be displayed to the operator.	Implemented as an off-line query using SQL*Plus.
PM-INIT-01.02	6	During initialization, the MPS/PM-1 simulator shall provide the operator with the capability to select one version of the PM-1 PDB from among those that are resident within the Oracle database.	
PM-INIT-01.03	6	During initialization, if the operator does not select a version of the PM-1 PDB, the MPS/PM-1 simulator will default to the most recent version available in the database.	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMMDL-01		The MPS/PM-1 simulator shall provide a telemetry parameter orbit modeling capability. The purpose of this capability is to simulate the behavior of a limited set of telemetry parameters on an orbit basis.	Implementation of the modeling capability, beyond which is currently provided by scenario files, has been deferred. The SIMSS group will be providing a generic modeling capability at a later date. Modeling will then be incorporated into a subsequent MPS release.
PMMDL-02		The MPS/PM-1 simulator shall turn on and off selected orbit modeling under operator control.	
PMMDL-03		The MPS/PM-1 simulator shall be capable of changing between static, table, or algorithm models under operator control	
PMMDL-04		The MPS/PM-1 simulator shall execute modeling directives that enable or disable selected orbit modeling.	
PMMDL-05		The MPS/PM-1 simulator shall execute modeling directives that associate any telemetry parameter with any predefined model.	
PMMDL-06		The MPS/PM-1 simulator shall execute modeling directives that change between static, table, or algorithm models.	
PMMDL-07		The MPS/PM-1 simulator shall provide the operator with an offline capability to access model functions and coefficients.	
PMMDL-08		The MPS/PM-1 simulator shall provide the operator with an offline capability to translate ASCII-formatted files containing static, table, and algorithm orbit modeling information into a binary form readable by The MPS/PM-1 simulator.	
PMTLM-01	4	The MPS/PM-1 simulator shall be capable of switching between IP and serial modes of operation for command receipt and telemetry transmission.	Requirement added in response to DRTT CR # SMOdr06370.
PMTLM-02	1,3	The MPS/PM-1 simulator shall provide the capability to transmit one stream of telemetry when in IP mode.	
PMTLM-03	3	The MPS/PM-1 simulator shall be capable of independently configuring telemetry and CLCW transmit when in IP mode.	
PMTLM-03.01	2,3	The MPS/PM-1 simulator shall be capable of transmitting packets containing CLCWs independently of telemetry transmission when in IP mode	
PMTLM-03.02	1	The MPS/PM-1 simulator shall be capable of independently configuring IP mode telemetry and CLCW transmission to UDP MULTICAST mode when in IP mode.	
PMTLM-03.03	1	The MPS/PM-1 simulator shall be capable of independently configuring IP mode telemetry and CLCW transmission to any valid UDP MULTICAST IP address when in IP mode.	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMTLM-03.04	1	The MPS/PM-1 simulator shall be capable of independently configuring IP mode telemetry and CLCW transmission to any valid UDP MULTICAST Port number when in IP mode.	
PMTLM-03.05	1	The MPS/PM-1 simulator shall be capable of independently configuring IP mode telemetry and CLCW transmission to any block length between one and 6000 bytes when in IP mode.	
PMTLM-03.06	1	The MPS/PM-1 simulator shall be capable of independently configuring IP mode telemetry transmission to variable block length when in IP mode.	
PMTLM-04	4	The MPS/PM-1 simulator shall be capable of transmitting two streams of CADUs (simulating the I and Q channels) when in serial mode.	Requirement added in response to DRTT CR # SMOdr06370.
PMTLM-04.01	4	When in serial mode, the MPS/PM-1 simulator shall build S-band CADUs as described in the PM-1 Spacecraft to Ground ICD.	Requirement added in response to DRTT CR # SMOdr06370.
PMTLM-04.02	4	When in serial mode, the MPS/PM-1 simulator shall build and transmit Fill CADUs as described in the PM-1 Spacecraft to Ground ICD when there is not enough telemetry data available to fill a CADU.	Requirement added in response to DRTT CR # SMOdr06370.
PMTLM-05	3	The MPS/PM-1 simulator shall accept and execute operator directives that set the value of any telemetry parameter by mnemonic.	
PMTLM-06	5	The MPS/PM-1 simulator shall accept and execute operator directives that set the value of any location in the PM-1-simulated spacecraft memory.	
PMTLM-07	3	The MPS/PM-1 simulator shall accept and execute operator directives that request the value of any telemetry parameter for display.	Reworded slightly for accuracy.
PMTLM-07.01	6	The MPS/PM-1 simulator shall be capable of displaying telemetry parameter values in decimal raw counts and in Engineering Units	Requirement added with Release 6.
PMTLM-07.02	6	The MPS/PM-1 simulator shall use the PDB to define raw-data-to-EU and EU-to-raw-data conversions for telemetry parameters.	Renumbered from PMTLM-38. Reworded to reflect as-built design.
PMTLM-07.03	6	The MPS/PM-1 simulator shall permit the operator to update telemetry parameter values in decimal, hex, and octal raw data numbers, and in Engineering Units.	Entry via GUI window is in decimal and EU only.
PMTLM-07.04	6	The MPS/PM-1 simulator shall be capable of displaying multiple telemetry parameter values in a GUI window.	Requirement added with Release 6.
PMTLM-07.05	6	The MPS/PM-1 simulator shall be capable of displaying multiple iterations of a GUI window for display and update of telemetry parameters.	Requirement added with Release 6.
PMTLM-08	1	The MPS/PM-1 simulator shall accept and execute operator directives that request the contents of any telemetry packet.	
PMTLM-09	6	The MPS/PM-1 simulator shall accept and execute operator directives that request the value of any location or block of locations in simulated spacecraft memory.	Implemented as part of the generic buffer display capability (PMGUI-15)

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMTLM-10	5	The MPS/PM-1 simulator shall set initial telemetry parameter values from information extracted from the PM-1 PDB and user provided files.	
PMTLM-11	1	The MPS/PM-1 simulator shall accept and execute operator directives that result in changes to telemetry packet header values.	
PMTLM-12	6	The MPS/PM-1 simulator shall execute telemetry directives that control the PM-1 Solid State Recorder.	Implemented as part of the scenario script capability.
PMTLM-13	6	The MPS/PM-1 simulator shall provide for the storage of housekeeping telemetry to be used as playback data.	
PMTLM-14	4	The MPS/PM-1 simulator shall use the information from the PM-1 PDB to generate and transmit telemetry packets.	
PMTLM-14.01	3	The MPS/PM-1 simulator shall be capable of creating CCSDS-format telemetry packets from information contained in the PM-1 PDB telemetry packet specification file.	
PMTLM-14.02	3	The MPS/PM-1 simulator shall provide the capability to generate and transmit telemetry packets with APIDs identical to the PM-1 spacecraft.	
PMTLM-14.03	4	The MPS/PM-1 simulator shall use the APID and secondary key fields of the PM-1 PDB packet definition file to identify unique packets.	Requirement added in response to DRTT CR # SMOdr06279.
PMTLM-14.04	4	The MPS/PM-1 simulator shall generate a telemetry packet for each unique combination of APID and secondary key.	Requirement added in response to DRTT CR # SMOdr06279.
PMTLM-14.05	1,4	The MPS/PM-1 simulator shall accept and execute operator directives to set the packet generation rate for any APID and secondary key combination defined in the PM-1 PDB.	Requirement added in response to DRTT CR # SMOdr06279.
PMTLM-14.06	3	The MPS/PM-1 simulator shall populate the telemetry packet primary header fields in the following list in accordance with information obtained from the PM-1 Spacecraft to Ground ICD and applicable CCSDS documents: Version Number, Type, Secondary Header Flag, APID, Sequence Flag, Sequence Count, and Packet Length.	
PMTLM-14.07	4	The MPS/PM-1 simulator shall place the secondary key into the telemetry packet at the offset specified by the PM-1 PDB telemetry packet specification file and shall use the number of bits specified by that file.	Requirement added in response to DRTT CR # SMOdr06279.
PMTLM-14.08	4	The MPS/PM-1 simulator shall generate a telemetry packet secondary header in accordance with the secondary header type (SC, GIRD, or None for SUROM-TIE packets) implied by the contents of the packet type field of the PM-1 PDB telemetry packet specification file. For each secondary header type, the contents shall be as described in applicable sections of the PM-1 Spacecraft to Ground ICD.	
PMTLM-15	1	The MPS/PM-1 simulator shall insert simulated spacecraft time in the telemetry packet headers	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMTLM-16	3	The MPS/PM-1 simulator shall maintain data values for all telemetry parameters defined in the PDB telemetry parameter specification file. These data values shall be available for display to the operator and for inclusion into telemetry packets.	
PMTLM-16.01	4	The MPS/PM-1 simulator shall be capable of inserting telemetry point values into packets using information from the PM-1 PDB telemetry description and telemetry parameter specification files.	
PMTLM-16.02	4	The MPS/PM-1 simulator shall use the APID and secondary key fields of the PDB telemetry parameter specification file to determine the correct packet for each telemetry parameter.	Requirement added in response to DRTT CR # SMOdr06279.
PMTLM-17	3	The MPS/PM-1 simulator shall send out telemetry packets at specified intervals of spacecraft time. These specific intervals shall be as defined by the PDB for each APID and secondary key combination and shall be modifiable by the operator.	Requirement added in response to DRTT CR # SMOdr06279.
PMTLM-18	5	The MPS/PM-1 simulator shall be capable of simulating memory dumps. The MPS/PM-1 simulator shall build packets based on the contents of the simulated memory.	
PMTLM-19	1	The MPS/PM-1 simulator shall execute telemetry directives that start and stop transmission of data.	
PMTLM-20	1	The MPS/PM-1 simulator shall accept and execute operator directives that start and stop logging of telemetry and CLCWs independently.	
PMTLM-21	1	The MPS/PM-1 simulator shall generate EDUs and EDOS data headers based on the User Datagram Protocol (UDP) format defined in the EDOS External ICD Data Format Control Document.	
PMTLM-22	6	The MPS/PM-1 simulator shall allow modification of any field within the EDOS data header.	
PMTLM-23	2	The MPS/PM-1 simulator shall provide the capability of transmitting the CLCW in the form of EDUs to EOC through EBnet.	
PMTLM-24	2	The MPS/PM-1 simulator shall provide the capability to enable and disable the transmission of CLCW EDUs.	
PMTLM-25	6	The MPS/PM-1 simulator shall provide for the storage of EDUs during the testing session for later transmission.	Reworded to reflect as-built design.
PMTLM-26	1	The MPS/PM-1 simulator shall transmit EDUs on an as built basis.	
PMTLM-27	1	The MPS/PM-1 simulator shall provide the capability to transmit EDUs using the UDP protocol.	
PMTLM-28	6	The MPS/PM-1 simulator shall provide the capability to transmit data files via FTP upon user request.	Implemented via the Windows NT FTP program.
PMTLM-29	6	The MPS/PM-1 simulator shall be capable of creating signal files and transmitting them via FTP at user request.	Not specifically implemented. May be emulated by transmit of an empty file via the Windows NT FTP program.
PMTLM-30	1	The MPS/PM-1 simulator interface with the EOC shall comply with the telemetry interface formats and protocols specified in the EDOS to EGS Elements interface document	

Attachment G – Requirements Matrix

PM-1 Requirement	Release	MPS/PM-1 Requirement Description	Comments
PMTLM-31	5	The MPS/PM-1 simulator, when acting as a spacecraft, shall comply with the telemetry data formats and protocols specified in the TGT to EDOS interface document.	
PMTLM-32	5	The MPS/PM-1 simulator, when acting as an EPGS, shall comply with the telemetry data formats and protocols specified in applicable interface documents for the EPGS to EDOS interface.	
PMTLM-33	6	The MPS/PM-1 simulator shall provide the capability to accept PM-1 telemetry data by electronic transmission and by physical media.	
PMTLM-34	6	The MPS/PM-1 simulator shall be capable of transmitting the contents of a user provided file containing PM-1 telemetry data.	
PMTLM-35	1	The MPS/PM-1 simulator shall be capable of maintaining an internally generated time code.	
PMTLM-36	1	The MPS/PM-1 simulator shall set, adjust, and operate the spacecraft clock as commanded.	
PMTLM-37	3	The MPS/PM-1 simulator shall employ an offline utility to convert the ASCII-formatted PDB into a binary format useable by The MPS/PM-1 simulator.	
PMTLM-38	1	The MPS/PM-1 simulator shall provide the capability to store up to 8MB of transmitted EDUs.	Renumbered from PMTLM-39
PMTLM-39	5	The MPS/PM-1 simulator shall be capable of modifying multiple consecutive buffer locations via a single operator directive.	Requirement added in response to DRTT CR # SMOdr05859.
PMTLM-40	5	The MPS/PM-1 simulator shall be capable of a limited simulation of clock correlation telemetry. This shall be accomplished by populating APID 1000 packets with simulated GIIS and GIRD spacecraft time.	Requirement added in response to DRTT CR # SMOdr06821.
PMTLM-41	5.1	The MPS/PM-1 simulator shall maintain a VCDU counter in APID 1000 and maintain synchronization between it and the VCDU counter in CLCW packets when operating in IP mode, and will synchronize the APID 1000 VCDU counter with that of the enclosing VCDU when in serial mode.	Requirement added in response to DRTT CR # SMOdr07120.

Release Legend:

n – Release in which requirement was satisfied.

nP – Partially satisfied in Release n.

Attachment H – System Limitations

H.1 MPS/PM1 Release 6.0 Limitations

The following limitations apply to MPS/PM1 Release 6.0. Some of these are Discrepancy Reports (DRs) against SIMSS baseline products and have been recorded in their DR repository. For the others, a determination is being made as to whether they are SIMSS or MPS/Aqua DRs, and then the DR will be issued against the appropriate system.

Problem Description	Workaround
<p>The event message window can accept no more than 20 messages per second. The Scenario module can easily overrun this limit and flood the GUI with messages.</p> <p><i>This is SIMSS Defect #133. It is reported fixed in the SIMSS baseline software but may require complementary repair to the SCPM1 module.</i></p>	<p>Use Sleep directives to slow scenario files to 20 directives per second or less.</p>
<p>The Generic Container Buffer display is limited to 1400 bytes of data (= 700 words, or 350 double words). A request for more data than that will result in a display of 1400 bytes of information.</p> <p><i>This is SIMSS Defect # 102.</i></p>	<p>To view data that is beyond byte 1400 of the buffer, set the offset to 1400, or as required to view the data.</p>
<p>If a container item name such as a telemetry mnemonic is entered into multiple displays of the <i>Display/Set Container Items...</i> window and updated in a higher numbered display, the update will not be reflected in lower numbered display(s).</p>	<p>Do not duplicate container item names unless absolutely necessary.</p>
<p>The scenario file names display window can only accept 1400 bytes of information. If the file names in the folder total more than 1400 bytes, the excess will not be displayed.</p> <p><i>This is SIMSS Defect # 212. This defect was written against the Server crash upon attempt to display more than 1400 characters of filenames.</i></p>	<p>If the desired file does not appear in the file selection window, it may be started by typing its name in the filename entry line. Alternatively, one may keep the number of files low by spreading files among two or more folders.</p>

Problem Description	Workaround
After the first scenario script is started the default folder reverts to the server folder.	Double-click on the scenario folder icon in the file selection window. This will cause the simulator to read and display the contents of the scenario folder.
Occasionally the scenario file selection display becomes unreadable.	Pressing the Page Down then the Page Up key will restore the display.
When using SQL*Plus to select entries from the Oracle calcurve table via the conversion type field, <i>conv_type</i> , it is necessary to put a space after the type entry. e.g. "U_5D ", not "U_5D".	Given at left.
The module TxFile cannot accept blank space in the filename or path given to it.	Place files to be transmitted by TxFile into the root of the D: drive, or create a path with no spaces in the folder names.
IP addresses that contain leading zeros will be interpreted differently from those that do not have leading zeros. ex. 239.020.002.005 is not equal to 239.20.2.5	Don't put leading zeros on IP addresses when setting up the input IP and output IP modules.
Any APID in the tlm_packet PDB flat file that does not have a legitimate interval in one or more packet list columns will result in a number of APIDs being rejected by the simulator.	The PDB ingest scripts have been modified to set the interval to one second for any APID that does not have a non-zero interval.

H.2 Assumptions

1. The IP input buffer for commanding for Release 6.0 is defined to be 6000 bytes long. The Command Data Block (CDB) messages may contain multiple CLTU messages.
2. Each AD Transfer Frame is assumed to contain one complete Packet.

Attachment I - Release History Summary Matrix

Attached is the release history summary matrix, which reflects the MPS/PM-1 Release 6.0 delivery.

Release History Summary Matrix

System: **MPS/Aqua**

Release Number		1.0	1.1	2.0	2.1	2.2	3.0	3.1	4.0	5.0	5.1	6.0 Beta	6.0 Beta Update 1	6.0
Delivery Date		7/30/99	9/2/99	9/24/99	10/25/99	11/18/99	12/17/99	1/21/00	3/17/00	5/12/00	6/22/00	7/28/00	9/14/00	9/28/00
Configuration Item	CI No.													
Core (Client)	1.1	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
Core (Server)	1.2	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
SC-PM1 (Client)	1.3	1.0	1.1	2.0	2.1	2.2	3.0	3.1	4.0	5.0	5.0	6.0	6.0	6.0
SC-PM1 (Server)	1.4	1.0	1.1	2.0	2.1	2.2	3.0	3.1	4.0	5.0	5.1	6.0	6.0	6.0
GS (Client)	1.5	1.0	1.1	2.0	2.1	2.2	3.0	3.1	4.0	5.0	5.0	6.0	6.0	6.0
GS (Server)	1.6	1.0	1.1	2.0	2.1	2.2	3.0	3.1	4.0	5.0	5.0	6.0	6.0	6.0
IP Input (Client)	1.7	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
IP Input (Server)	1.8	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
IP Output (Client)	1.9	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
IP Output (Server)	2.0	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
DQM (Client) ¹	2.1													
DQM (Server) ¹	2.2													
Logging (Client)	2.3	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0
Logging (Server)	2.4	1.0	1.0	2.0	2.0	2.0	3.0	1.0	1.0	1.1	1.1	2.0	2.0	2.0

¹ To be delivered in a future release

Release Number		1.0	1.1	2.0	2.1	2.2	3.0	3.1	4.0	5.0	5.1	6.0 Beta	6.0 Beta Update 1	6.0
Delivery Date		7/30/99	9/2/99	9/24/99	10/25/99	11/18/99	12/17/99	1/21/00	3/17/00	5/12/00	6/22/00	7/28/00	9/14/00	9/28/00
Configuration Item	CI No.													
Scenario (Client) ²	2.5								1.0	1.1	1.1	2.0	2.0	2.0
Scenario (Server) ²	2.6								1.0	1.1	1.1	2.0	2.0	2.0
Serial Input (Client) ²	2.7								1.0	1.1	1.1	2.0	2.0	2.0
Serial Input (Server) ²	2.8								1.0	1.1	1.1	2.0	2.0	2.0
Serial Output (Client) ²	2.9								1.0	1.1	1.1	2.0	2.0	2.0
Serial Output (Server) ²	3.0								1.0	1.1	1.1	2.0	2.0	2.0
TxFile (Client) ³	3.1													2.0
TxFile (Server) ³	3.1													2.0

² New in Release 4.0

³ New in Release 6.0

Attachment J - Delivery Details

J.1 Hardware for MPS/PM-1 units in GSFC, Building 32

There are two CSOC-owned PCs in Building 32.

PC #1:

Qty	Common Name	Model [Serial No.]	Mfg	CSOC No.	Description
1	Computer	E-4200 001-343-8943	Gateway	C0060047	Intel Pentium II 400 Mhz w /512 Cache, 128 MB SDRAM PC100 6ns Micron, Matrox Millenium II 8MB AGP Video card, Toshiba 32x SCSI CD ROM Drive, Seagate 9.1 GB hard disk, IOMEGA 100 mb internal zip drive
1	Monitor	VX1100 811053233	Gateway	C0060041	21" Monitor
1	Mouse	Intellimouse 2570734- 10000	Gateway		
1	Keyboard	Q9045A1837	Gateway		
1	Timing Card	PCIDCC20-P	Industrial Computer Source		PCI counter/timer card

PC #2:

Qty	Common Name	Model [Serial No.]	Mfg	CSOC No.	Description
1	Computer	E-4200 001-343-8944	Gateway	C0060050	Intel Pentium III 450 Mhz w /512 Cache, 128 MB SDRAM PC100 6ns Micron, Matrox Millenium II 8MB AGP Video card, Toshiba 32x SCSI CD ROM Drive, Seagate 9.1 GB hard disk, IOMEGA 100 mb internal zip drive
1	Monitor	VX1100 811053233	Gateway	C0060041	21" Monitor
1	Mouse	Intellimouse	Gateway		
1	Keyboard		Gateway		

J.2 Software

A complete listing of the MPS/PM-1 software file names is available upon request.

Attachment K - Documentation References

The following documents have been employed as the main sources for direction and information in producing Release 6.0 of the MPS/PM-1 simulator.

Document	Location*
EOS PM-1 Spacecraft to EOS Ground System Interface Control Document, GSFC 422-11-19-03, dated December, 1999 (more commonly known as "The Space to Ground ICD")	2
Appendix Z – PM-1 Spacecraft Interface with Control Center - Supplement to the EOS PM-1 Spacecraft to EOS Ground System Interface Control Document (GSFC 422-11-19-03), - dated December, 1999	2
Data Format Control Document for the Earth Observing System (EOS) Mission Operations Segment (EMOS) Project Database Volume 1: PM-1 Users Revision -, dated January 2000	4
TRW, EOS PM-1 Spacecraft Flight Software Requirements Specification, ES-SDA-001	1
TRW, Earth Observing System Common Spacecraft Program Flight Software User's Guide, No.: D26696, latest version dated July 31, 1998	1
TRW, EOS Common Spacecraft Command Allocation Document, No.: D25099, (preliminary)	1
TRW, Earth Observing System (EOS) EOS PM-1 Telemetry Allocation Document, No.: D25100, (preliminary)	1
TRW, EOS PM-1 Spacecraft Equipment Specification for Transponder Interface Electronics, No.: EQ4-4957, latest version dated 11 February, 1999	1
TRW, Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements CDRL B301	2
Consultative Committee for Space Data Systems, CCSDS 102.0-B-4: Packet Telemetry Blue Book, Issue 4, Nov. 1995	3
--, CCSDS 202.1-B-1: Telecommand Part 2.1 – Command Operations Procedures Blue Book, Issue 1, Oct. 1995	3
NASA, GSFC, Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Functional and Performance Requirements for the PM-1 Spacecraft, Sep. 1998	-

*Location Legend:

Number	Designation
1	http://www.omitron.com/eosagua/mittrw.HTM
2	http://esdis-it.gsfc.nasa.gov:8080/servlet/DOCcat?nCatType=ICD
3	http://ccsds.org/publications.html
4	ftp://198.118.192.20/pub/fot/pm1/pdb/DFCD/

Attachment L — Mission Systems Configuration Management Form

This attachment contains the completed Mission Systems Configuration Management (MSCM) form for the delivery of MPS/PM1 Release 6.0.

Mission Systems Configuration Management Form

<u>1. ORIGINATOR</u> Estelle Noone	<u>2. ORGANIZATION</u> CSC	<u>3. PHONE</u> 301-805-3653	<u>4. E-MAIL ADDRESS</u> enoone@csc.com
<u>5. ELEMENT</u> ETS (MPS/PM1)		<u>6. INSTALLATION PRIORITY</u> Routine	<u>7. TRACKING NUMBER</u> (Assigned by CM Office)
<u>8. SOURCE CHANGE REQUEST(S):</u> ETS delivery of MPS for EOS PM-1 (MPS/PM1)		<u>9. APPROVALS</u> <div style="display: flex; justify-content: space-between;"> <div>Element Manager</div> <div>_____</div> <div>____/____/____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Flight Ops Director</div> <div>_____</div> <div>____/____/____</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Operations Manager</div> <div>_____</div> <div>____/____/____</div> </div>	
<u>10. DELIVERED SYSTEM</u> (Check all that apply)			
	Name	Version	Media Identification
<input type="checkbox"/> Hardware	_____	_____	_____
<input checked="" type="checkbox"/> Software	MPS/PM1	R6.0	CD-ROM
<input type="checkbox"/> Database	_____	_____	_____
<input checked="" type="checkbox"/> Documentation:			
	MPS/PM1 delivery package	N/A	3.5 " Diskette
	MPS/PM1 Release 6 User's Guide	R6.0	http://esdis-it.gsfc.nasa.gov/ETS/etsdoc.html
	_____	_____	_____
<input type="checkbox"/> Other	_____	_____	_____
<u>11. CHANGE DESCRIPTION</u> Release 6.0 of MPS/PM-1 (MPS/PM-1) _____ _____ _____			
<u>12. ATTACHMENT(S):</u> Check if YES <input checked="" type="checkbox"/> Description: MPS/PM1 Release 6.0 delivery package (cover letter with attachments) dated 09/28/00 _____ _____			
<u>13. CM OFFICE USE</u>			
	Location (Bldg/Room)	Slot location(s)	
Hardware	____/____	_____	
Media	____/____	_____	
Documentation	____/____	_____	
Installation date	____/____/____	CM Office Signature _____	

Form MSCM (970327)

EOSDIS Test System (ETS)

DOCUMENTATION

Note: This page is currently being updated - thank you for your patience!

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System Description

The *Earth Observing System (EOS) Data and Information System (EOSDIS) Test System (ETS)* currently consists of two data generation simulators and test tools that can be used to test key EOSDIS data interfaces at the EOC, DAACs, EDOS, and ground stations. These two data generation tools are as follows:

- **MPS - The Multimode Portable Simulator**

The MPS is a low-fidelity spacecraft communications simulator developed to support testing of forward-link and non-science, return-link processing. The MPS operates in a serial spacecraft data mode and in an IP network mode, which simulates the spacecraft data across the EDOS and control center interface. Separate units are available for Terra and Aqua data simulations.

- **SCTGEN** - The **Simulated** *Consultative Committee for Space Data Systems (CCSDS)* **Telemetry Generator**

SCTGEN has been developed as part of the ETS Project. It is used to create data files that simulate CCSDS telemetry data streams and EOS Data and Operations System (EDOS) generated data products. A data transmission system is needed to actually transmit the SCTGEN-generated data files into EDOS or a DAAC, for example.

Two other ETS simulators were also developed for EOS Mission Systems, but they are no longer being supported. These systems are as follows:

- The High-Rate System (HRS) -- EOSDIS return-link science data processing and interface test tool.
- The Low-Rate System (LRS) -- Functional EDOS interface between the EOC and either the Spacecraft Integration and Test Facility (SCITF) or Spacecraft Simulator (SSIM).

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System Delivery Packages

Multimode Portable Simulator (MPS) for PM-1, or MPS/PM-1 (Aqua)

- [Release 1.0](#) [PDF 137k]
 - [Engineering Release 1.1](#) [PDF 22k]
- [Release 2.0](#) [PDF 107k]
 - Engineering Release 2.1
 - Engineering Release 2.2
- [Release 3.0](#) [PDF 146k]
 - [Engineering Release 3.1](#)
- [Release 4.0](#) [PDF 155k]
- [Release 5.0](#) [PDF 184k]
 - [Engineering Release 5.1](#) [PDF 39k]

Simulated CCSDS Telemetry Generator (SCTGEN) for PM-1 (Aqua)

- [Release 2.0](#) (originally called 1.5.0)
 - [Engineering Release 2.1](#) (originally called 1.5.0a)
 - [Engineering Release 2.2](#) (originally called 1.5.0b)

Historical (Deliveries prior to mid-1999)

MPS for AM-1 (Terra)

- [Release 1.2.0](#)
- [Release 1.2.1](#)
- [Release 1.3.0](#)
- [Release 1.4.0](#)
- Release 1.5.0
- [Release 1.6.0](#)

High Rate System (HRS)

- [Release 1.1.0](#)
- [HRS Closeout](#)
- [Updated HRS Closeout](#)

SCTGEN for AM-1 (Terra)

- [Release 1.0](#)
- [Release 1.1.0](#)
- [Release 1.2.0](#)
- [Release 1.3.0](#)
- [Release 1.4.0](#)
- [Release 1.5.0 \(later renumbered Release 2.0\)](#)

Documents

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Current ETS Aqua Support

MPS for PM-1 (or MPS/PM-1)

- Requirements Documents (TBS)
- User's Guide

Draft System User's Guide for the MPS/PM-1 (SIMSS/PM-1) Simulator, Release 5.0 - May 2000

This document provides guidance for using the ETS PM-1 spacecraft simulator software produced as part of the Scalable, Integrated Multimission Simulation Suite (SIMSS) development effort. It is applicable to Release 5.0. [[PDF](#) (417 k)]

User's Guide for **Release 4.0** [[PDF](#) (2.9 M)]

User's Guide for **Release 3.0** [[PDF](#) (310 k)]

SCTGEN for PM-1

- User's Guide

NASA, GSFC, 512-UG-012, SCTGEN System User's Guide, Release 1.2.0 - September 22, 1997

This document provides the procedures to use Release 1.2.0 of the Simulated Consultative Committee for Space Data Systems (CCSDS) Telemetry Generator (SCTGEN). SCTGEN has been developed as part of the Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Project. SCTGEN is an off-line test data generation tool, which can be used to simulate CCSDS telemetry data streams and EOS Data and Operations System (EDOS) generated data products. In conjunction with other ETS components, SCTGEN is being used to support EOS ground system integration and test activities. [[PDF](#) (3.2 M)]

Historical (Documents prior to 1999)

- **NASA, GSFC, 515-3OCD/0194 (CSC/TR-94/6085), Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Operations Concept - May 1995**

This document describes the operations concept for the ETS. It describes the test and simulation systems comprising ETS. It presents the system operations concept for each of the five test configurations in which ETS will be used to support integration and testing of the EOSDIS ground system. Changes since May 1995, when the document was last release, have occurred in the EOSDIS ground system, which have contributed to changes in the ETS operations concept; however, the document was never intended to be maintained to reflect the current developed system. The document is included here for historical reference. [[PDF](#) (280 k)]

- **NASA, GSFC, 515/4FRD/0294 (CSC/TR-94/6084), ETS Functional and Performance Requirements - March 1996**

This document contains the level 3 functional and performance requirements for the Earth Observing System Data and Information System (EOSDIS) Test System (ETS), and has been approved as an original baseline by the MOSDD CCB. This document has recently been submitted to the Code 505 CCB for approval. [[PDF](#) (230 k)]

- **User's Guide ETS OMDSIM, Review - February 1997**

This document provides guidance for using the Earth Observing System (EOS) Data and Information System (EOSDIS) Test System (ETS) Operations Management Data Simulator (OMDSIM). The ETS OMDSIM is a software

application that provides a source of OMD messages to supplement the capabilities of ETS-simulated mission data generation and reception. In particular, OMDSIM supports Customer Operations Data Accounting (CODA) reports, Spacecraft Contact Session (SCS) reports, PDS/EDS Delivery Records, and PDS/EDS Acceptance Notification. OMDSIM runs on all three ETS hardware platforms: MPS, LRS, and HRS. [[PDF](#) (731 k)]

- **Joint ESDIS/ETS Action Item List**

This list provides the final status of action items resulting from the ETS System Design Review (SDR) held May 19, 1995. [[PDF](#) (51 k)]

- **ETS Detailed Design Specification**

Volumes 1-5, Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Detailed Design Specifications (DDS):

- **NASA, GSFC, (515-DDS-001), ETS Detailed Design Specification, Volume 1, Index and Support Software - March 1996**

This volume describes the Control and Display Subsystem (CDS) software exclusive of the Telemetry Processing Control Environment (TPCE) and the Simulated CCSDS Telemetry Generator (SCTGEN) software being developed for all three ETS systems, as well as providing an index to the other ETS volumes. TPCE and SCTGEN are NASA Code 520 products that are described in other volumes in the set. Volume 1 of the ETS design specification contains revisions reflecting the ETS Final Design Walk-Through reviews held 2 and 29 February 1996. [[PDF](#) (570 k)]

- **NASA, GSFC, (515-DDS-002), ETS Detailed Design Specification, Volume 2 - Multimode Portable Simulator, March 1996**

This volume describes the detailed design for the Multimode Portable Simulator (MPS). Volume 2 of the ETS design specification contains revisions reflecting the ETS Final Design Walk-Through review held 2 February 1996. [[PDF](#) (451 k)]

- **NASA, GSFC, (521-DDS-002), ETS High-Rate System Detailed Design Specification, Volume 3 - October 1996**

This volume describes the detailed design specifications for the ETS High-Rate System (HRS) being developed by the Goddard Space Flight Center (GSFC) Microelectronic Systems Branch (MSB). Volume 3 of the ETS design specification contains revisions reflecting the ETS Final Design Walk-Through review held February 1996. [[PDF](#) (742 k)]

- **NASA, GSFC, (521-DDS-001), ETS VME Low-Rate System Detailed Design**

Specification, Volume 4 - February 1996

This volume describes the detailed design specifications for the ETS Versa Module Eurocard (VME) Low-rate System (VLS) being developed by the Goddard Space Flight Center (GSFC) Microelectronic Systems Branch (MSB). Volume 4 of the ETS design specification contains revisions reflecting the ETS Final Design Walk-Through review held 2 February 1996. [[PDF](#) (723 k)]

- **NASA, GSFC, (521-DDS-003), ETS SCTGEN Detailed Design Specification, Volume 5 - February 1996**

This volume describes the detailed design specifications for the ETS Simulated CCSDS Telemetry Generator (SCTGEN) being developed by the Goddard Space Flight Center (GSFC) Microelectronic Systems Branch (MSB). Volume 5 of the ETS design specification contains revisions reflecting the ETS Final Design Walk-Through review held February 1996. [[PDF](#) (360 k)]

- **MPS/AM-1 (Terra) *originally called MPS***

- **NASA, GSFC, (CSC/EOS-ETS/SD-1296/01), User's Guide Earth Observing System (EOS) Data and Information System (EOSDIS) Test System (ETS) Multimode Portable Simulator (MPS) Release 1.6.0 - June 1999**

This document provides guidance for using the ETS MPS and is applicable to MPS Release 1.6.0. [[PDF](#) (1,132 k)]

- **ETS High-Rate System**

- **NASA, GSFC, 521-UG-017, ETS High-Rate System User's Guide, Volume 1 - February 1998**

This document is Volume 1 of a two-volume set. It provides the procedures used to operate and maintain the Earth Observing System Data and Information System (EOSDIS) Test System (ETS) High-Rate System (HRS). Its main purpose is to acquaint users with the VME rack and the two user interfaces that are available to control and monitor the ETS HRS. This document provides procedures and information specific to the text-based user interface, which is called the Operations Manager (OPMAN) and which runs on a VT-100 (or equivalent) terminal. Information specific to the Graphical User Interface (GUI) Telemetry Processing Control Environment (TPCE), which runs on the HP workstation, is provided in Volume 2. [[PDF](#) (614 k)]

- **NASA, GSFC, 521-UG-015, ETS High-Rate System TPCE User's Guide, Volume 2 - May 1997**

This document is Volume 2 of a two-volume set providing the procedures used to operate and maintain the Earth Observing System Data and Information System (EOSDIS) Test System (ETS) High-Rate System (HRS). This volume describes the ETS HRS telemetry processing control environment (TPCE), and how to use TPCE to monitor and control telemetry processing sessions. [[PDF](#) (902 k)]

- **ETS Low-Rate System**

- **NASA, GSFC, 521-UG-003, ETS Low-Rate System User's Guide, Volume 1 - April 1997**

This document is Volume 1 of a two-volume set. It provides the procedures used to operate and maintain the Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Low-Rate System (LRS). Its main purpose is to acquaint users with the VME rack and the two user interfaces that are available to control and monitor the ETS LRS. This document provides procedures and information specific to the text-based user interface, which is called the Operations Manager (OPMAN) and which runs on a VT-100 (or equivalent) terminal. Information specific to the Graphical User Interface (GUI) Telemetry Processing Control Environment (TPCE), which runs on the HP workstation, is provided in Volume 2. [[PDF](#) (495 k)]

- **NASA, GSFC, 521-UG-016, ETS Low-Rate System TPCE User's Guide, Volume 2 - May 1997**

This document is Volume 2 of a two-volume set providing the procedures used to operate and maintain the Earth Observing System Data and Information System (EOSDIS) Test System (ETS) Low-Rate System (LRS). This volume describes the ETS LRS telemetry processing control environment (TPCE) and how to use TPCE to monitor and control telemetry processing sessions. [[PDF](#) (4.8 M)]

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Presentations

MPS/PM-1 (Aqua)

EOSDIS Test System (ETS) for PM-1 Support ...

- **Design Status Presentation - May 13, 1999**

This document includes the slides and design materials that were presented and discussed at the ETS Design Status Presentation

held May 13, 1999. [[PDF](#) (284 k)]

- **Prototype Demo and Design Overview - February 24, 1999**

This document contains the slides that were presented at the demonstration of the PC-based prototype recommended for the MPS-PM1 simulator platform. [[PDF](#) (160 k)]

- **System Requirements and Design Review - September 17, 1998**

This document represents the slides that were presented and discussed at the ETS for PM-1 Support held September 17, 1998. [[PDF](#) (152 k)]

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SCTGEN

- **SCTGEN Training: CADU Generation** [[PDF](#) (68 k)]

CADU Generation Screens [[PDF](#) (457 k)]

These two documents include the slides that were presented at the SCTGEN Training for EDOS Acceptance Test Team members held January 25, 1999.

- **SCTGEN Training: PDS Generation - Part 1** [[PDF](#) (33 k)] **Part 2** [[PDF](#) (39 k)]

PDS Generation Screens [[PDF](#) (242 k)]

These three documents include the slides that were presented at the SCTGEN Training for Raytheon ECS personnel held August 7, 1998.

Historical (previous to 1997)

- **ETS Overview Training - November 18, 1996**

This document represents the slides that were presented and discussed at the ETS Overview Training presentation held November 18, 1996. [[PDF](#) (1.2 M)]

- **Tabulated ETS Design Review Management Presentation C/C Forms - March 8, 1996**

This table provides the final responses to the Comment/Clarification (C/C) forms received as a result of the ETS Design Review Management Presentation on March 8, 1996. [[PDF](#) (34 k)]

- **ETS Detailed Design Review Management Presentation -**

March 8, 1996

This document represents the slides that were presented and discussed at the ETS Detailed Design Review Management Presentation held March 8, 1996. [[PDF](#) (782 k)]

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Last revision: July 7, 2000
Responsible NASA Official: [Willie Fuller](#)
Web Design: [Elise Shurie](#)

REQUIREMENTS: [Netscape 3.0](#) (or later) browser



ESDIS

Discrepancy Report Tracking Tool

Choose from the following options:



[DRTT Access*](#)

This area provides access to the DRTT database for all registered users



[Info Desk](#)

Register for full DRTT access, browse our web tools, or send a message to the administrator



[PDTT Access*](#)

This area provides access to the PDTT database for all registered users



[Metrics](#)

View DRTT metrics based on DR status



[Training/Demo Slides](#)

View DRTT PowerPoint Training/Demo Slides



[Training/Demo Slides](#)

View PDTT PowerPoint Training/Demo Slides

NOTE: * indicates that you must be a registered user to access this function

About the [DRTT](#)

The purpose of the Discrepancy Report Tracking Tool (DRTT) is to manage and track all defects and discrepancies which are encountered during test activities of the EOS Ground System (EGS).

This home page is the user interface to the DRTT, which contains descriptions of all DRs which are written across EGS. The intent of the DRTT is to allow ESDIS personnel to quickly and easily input new DRs, search DRs currently in the DRTT database, and to generate statistical reports based on the DRs entered in the system.

The DRTT has been designed to support the ESDIS System Management Office (GSFC Code 505) and is maintained by the System Integration and Test (SI&T) Support Team.

[NASA Website Privacy Statement](#) * [NASA IT Security Warning Banner](#)

Prepared for: Paul Ondrus, paul.ondrus@gsfc.nasa.gov, GSFC Code 505

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Revised: 25 January 1999



ICDs

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* [Documents and Publications](#) * [ESDIS QMS / ISO 9000](#) *

-
- [421-11-19-02](#), Spacecraft Simulator (SSIM)/EOS Operations Center (EOC) Interface Control Document (ICD)
 - [422-11-19-03](#), EOS PM-1 Spacecraft to EOS Ground System Interface Control Document
 - [422-11-19-04](#), Appendix Z - PM-1 SPACECRAFT INTERFACE WITH CONTROL CENTER
 - [423-36-01](#), Interface Control Document (ICD) Between Earth Observing System (EOS) Missions Support Network (EMSn) and ICESat Science Investigator-led Processing System (ISIPS)
 - [423-41-35](#), INTERFACE CONTROL DOCUMENT Between the GSFC DAAC TRMM SUPPORT SYSTEM (TSS) and THE TROPICAL RAINFALL MEASURING MISSION (TRMM) SCIENCE DATA AND INFORMATION SYSTEM (TSDIS)
 - [423-41-43](#), ICD between ECS and the ASF DAAC
 - [423-41-44](#), Interface Control Document (ICD) Between EOSDIS Core System (ECS) and the Jet Propulsion Laboratory (JPL) Physical Oceanography Distributed Active Archive Center (PO.DAAC) for the ECS Project
 - [423-41-45](#), Interface Control Document (ICD) Between EOSDIS Core System (ECS) and the National Snow and Ice Data Center (NSIDC) Distributed Active Archive Center (DAAC) for the ECS Project
 - [423-41-50](#), ICD between ECS and ACRIM
 - [423-41-55](#), Interface Control Document between EOSDIS Core System (ECS) and the ESDIS Level 1 Product Generation System (LPGS)
 - [423-41-56](#), Interface Control Document between EOSDIS Core System (ECS) and the Data Assimilation System (DAS)
 - [423-41-57](#), Interface Control Document Between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing System (SIPS) Volume 0 Interface Mechanisms
 - [423-41-57-1](#), Interface Control Document between the EOSDIS Core System (ECS) and the

- Science Investigator-Led Processing System (SIPS) Volume 1: ECS ACRIM III SIPS Data Flows
- [423-41-57-2](#), Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-led Processing System (SIPS) Volume 2 ECS SAGE III SCF Data Flows
 - [423-41-57-3](#), Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-led Processing Systems (SIPS) Volume 3: ECS-ASTER Observation Schedule File (OSF) Parser System Data Flows
 - [423-41-57-4](#), Interface Control Document Between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS) Volume 4: ECS-ASTER DEM Data Flows
 - [423-41-57-5](#), Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-led Processing Systems (SIPS) Volume 5 ECS-MOPITT Data Flows
 - [423-41-57-6](#), Interface Control Document Between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS) Volume #6: ECS-MODIS SIPS (MODAPS) Data Flows
 - [423-41-57-7](#), Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS) Volume 7: AMSR-E Science Investigator-Led Processing System Data Flows
 - [423-41-57-8](#), Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-led Processing Systems (SIPS) Volume 8 Microwave Limb Sounder (MLS) ECS Data Flows
 - [423-41-57-9](#), Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-led Processing System (SIPS) volume 9 Machine-to-Machine Search and Order Gateway
 - [423-41-58](#), Interface Control Document between EOSDIS Core System (ECS) and the Earth Resources Observation System (EROS) Data Center (EDC)
 - [423-41-59](#), Data Format Control Document for the Earth Observing system (EOS) Mission Operations Segment (EMOS) Project Database Volume 1: PM Users
 - [423-41-60](#), Data Format Control Document for EMOS to ICC Planning and Scheduling Files for the ECS Project
 - [423-41-61](#), Interface Control Document between the Earth Observing System Operations Center (EOC) and the Independent Verification and Validation Facility (IVVF) at GSFC
 - [423-41-62](#), Interface Control Document Between Langley TRMM/Terra Information System (LATIS) and the EOS Data Gateway System for Interoperability
 - [423-41-63](#), Interface Control Document between the EOSDIS Mission Operations Segment (EMOS) and the Science Data Processing Segment (SDPS) for the ECS Project
 - [423-42-02](#), INTERFACE CONTROL DOCUMENT Between the GSFC DAAC TRMM SUPPORT SYSTEM (TSS) and the LaRC DAAC TRMM INFORMATION SYSTEM (LaTIS) for support of TRMM
 - [423-42-04](#), Interface Control Document between the Earth Science Data and Information System (ESDIS) Project (Code 423) and the Ground Network (GN) Project (Code 452) for the Tracking and Data Acquisition Support of the Earth Observing System (EOS) AM-1 Mission

- [423-42-05](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Operations Center (EOC) And the Wallops Orbital Tracking and Information System (WOTIS)
- [423-42-06](#), EOSDIS Information Management System EOS Data Gateway Messages and Development Data Dictionary VO and ASTER/ECS Message Passing Protocol Specification
- [423-ICD-EDOS/EGS](#), Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements
- [423-ICD-EDOS/GN](#), Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the Ground Network (GN)
- [430-11-06-007-3](#), DFCB for Landsat Zero-R Distribution Products, Volume 5 Book 1
- [430-11-06-009-D](#), LANDSAT 7 to International Ground Station (IGS) Interface Control Document
- [430-15-01-002-3](#), Landsat 7 System Calibration Parameter File Definition
- [450-RFICD-EOS PM-1/EPGS/WPS](#), Radio Frequency Interface Control Document Between the EOS-PM-1 Spacecraft and the EOS Polar Ground Station (EPGS) and the Wallops Orbital Tracking Station (WPS)
- [450-RFICD-EOS PM-1/STDN](#), Radio Frequency interface Control Document Between the EOS-PM-1 Spacecraft and the Spaceflight Tracking and Data Network
- [451-RFICD-EOS-AM/SN](#), Radio Frequency Interface Control Document Between the EOS-AM Spacecraft and the Space Network
- [452-RFICD-EPGS/ICESat](#), Radio Frequency (RF) Interface Control Document (ICD) Between the ICESat Spacecraft and the EOS Polar Ground Station (EPGS)
- [502-ICD-JPL/GSFC](#), Interface Control Document between the Jet Propulsion Laboratory and the Goddard Space Flight Center for GSFC Missions Using the Deep Space Network, Appendix AA, AM-1 Mission
- [502-ICD-MODSD/SPOD](#), Interface Control Document between the Mission Operations and Data Systems Directorate and the Suborbital Projects and Operations Directorate (Code 800) for GSFC Missions Requiring Support by the Wallops Orbital Tracking Station, Appendix F, Earth Observing System (EOS) AM-1 Mission
- [505-10-35-1](#), Data Format Control Document for the Earth Observing System (EOS) Flight Operations Segment (FOS) Project Data Base Volume 1: AM-1 Users
- [505-10-35-2](#), Data Format Control Document for the Earth Observing System (EOS) Flight Operations Segment (FOS) Project Data Base Volume 2: AM-1 Spacecraft
- [505-41-30](#), Interface Control Document Between EOSDIS Core System (ECS) and the Version 0 System for Interoperability
- [505-41-31](#), Interface Control Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI)
- [505-41-32](#), Interface Control Document (ICD) Between EOSDIS Core System (ECS) and the Landsat 7 System
- [505-41-33](#), Interface Control Document Between EOSDIS Core System (ECS) and Science

Computing Facilities (SCF)

- [505-41-34](#), Interface Control Document Between EOSDIS Core System (ECS) and Aster Ground Data System
- [505-41-35](#), Interface Control Document between EOSDIS Core SYstem (ECS) TRMM Science Data and Information System (TSDIS)
- [505-41-36](#), Interface Control Document between the EOSDIS Core System (ECS) and the National Oceanic and Atmospheric Administration (NOAA) Affiliated Data Center (ADC) for the ECS Project
- [505-41-37](#), Interface Control Document between EOSDIS Core System (ECS) and the Spacecraft Development and Validation Facilities (SDVF)
- [505-41-38](#), Interface Control Document Between EOSDIS Core System (ECS) and the EOS-AM Project for AM-1 Spacecraft Analysis System for the ECS Project
- [505-41-39](#), INTERFACE CONTROL DOCUMENT between the EOSDIS Core System (ECS) and the Langley Research Center (LaRC) Distributed Active Archive Center (DAAC) for the ECS Project
- [505-41-40](#), Interface Control Document between EOSDIS Core System (ECS) and the Goddard Space Flight Center (GSFC) Distributed Active Archive Center (DAAC) for the ECS Project
- [505-41-42](#), Interface Control Document Between EOSDIS Core Systems (ECS) and the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) for the ECS Project
- [505-41-47](#), Interface Control Document between the EOSDIS Core System (ECS) and the Stratospheric Aerosol and Gas Experiment III (SAGE III) Mission Operations Center
- [510-203.102](#), Sensor Data Processing Facility (SDPF) Consumer Products and Interface Specification Document
- [510-203.103](#), Interface Control Document between the Sensor Data Processing Facility (SDPF) and the Tropical Rainfall Measuring Mission (TRMM) Consumers
- [510-3DFC/0197](#), DFCB for ESDIS L1 Product Output Files, Volume 5 Book 2
- [510-3FCD/0195](#), Landsat 7 Processing System (LPS) Output Files Data Format Control Book
- [510-ICD-EDOS/ASTER](#), Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS)
- [510-ICD-EDOS/EBnet](#), Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOSDIS Backbone Network (EBnet)
- [510-ICD-EDOS/EPGS](#), Interface Control Document between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Polar Ground System (EPGS)
- [510-ICD-EDOS/ETS](#), Interface Control Document Between The Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Data and Information (EOSDIS) Test System (ETS)
- [510-ICD-EDOS/NOAA](#), Interface Control Document (ICD) Between The National Aeronautics and Space Administration (NASA) Earth Observing System (EOS) Data and Operations System

(EDOS) and the National Oceanic and Atmospheric Administration (NOAA)

- [510-ICD-EDOS/TGT](#), Interface Control Document Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the TDRSS Ground Terminals (TGTs)
- [530-ICD-NCCDS/MOC](#), INTERFACE CONTROL DOCUMENT BETWEEN THE NETWORK CONTROL CENTER DATA SYSTEM AND THE MISSION OPERATIONS CENTERS
- [531-RFICD-EOS AM-1/EPGS](#), X-band Radio Frequency Interface Control Document (RFICD) Between the Terra (EOS AM-1) Spacecraft and the EOS Polar Ground Stations (EPGS)
- [531-RFICD-EOS AM-1/EPGS/WOTS](#), S-Band Radio Frequency Interface Control Document (RFICD) between the EOS AM-1 Spacecraft and the EOS Polar Ground Station (EPGS) and the Wallops Orbital Tracking Station (WOTS)
- [540-031](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and EOSDIS Operations Center (EOC)
- [540-032](#), Interface Control Document (ICD) Between Earth Observing System (EOS) Missions Support Network (EMSn) and Distributed Active Archive Centers (DAAC)
- [540-034](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and the Flight Dynamics System (FDS)
- [540-036](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and Systems Monitoring and Coordination Center (SMC)
- [540-037](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS)
- [540-047](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and Tropical Rainfall Measuring Mission (TRMM) Science Data and Information System (TSDIS)
- [540-091](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and Spacecraft Checkout Station (SCS)
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- [540-093](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information system (EOSDIS) backbone network (EBnet) and Ground Support Equipment (GSE)
- [540-094](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and the Flight Software Testbed (FSTB)
- [540-095](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBnet) and Spacecraft Analysis System (SAS)
- [540-096](#), Interface Control Document (ICD) Between the Earth Observing System (EOS) Data and

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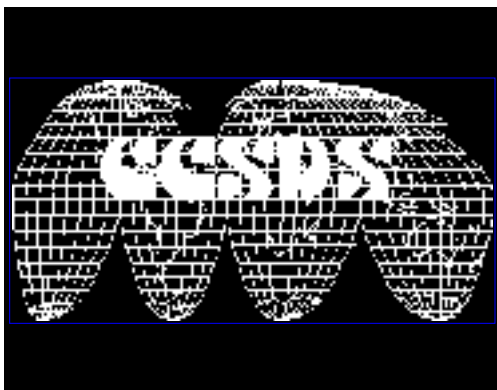
- [540-097](#), Interface Control Document between the Earth Observing System (EOS) Data and Information System (EOSDIS) Backbone Network (EBNET) and the LANDSAT Processing System (LPS)
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- [552-FDD-96/010R0UD0](#), Earth Observing System (EOS) AM-1 Flight Dynamics System (FDS)/EOSDIS Core System (ECS) Interface Control Document (ICD)
- [586-1ICD/0398](#), Interface Control Document Between the Level 1 Product Distribution System (LPDS) and the EOSDIS Core System (ECS)
- [AG-E-E-2209-R01](#), ASTER LEVEL 1 DATA PRODUCTS SPECIFICATION (GDS VERSION) Version 1.1
- [AG-E-E-2213-R01](#), ASTER Level 1 BROWSE DATA PRODUCTS SPECIFICATION (GDS Version) Version 1.1
- [FDS-DAACs-Aqua](#), Earth Observing System (EOS) Aqua/PM Flight Dynamics System (FDS)/Distributed Active Archive Center (DAAC) Interface Control Document (ICD)
- [FDS-EMOS-Aqua](#), Earth Observing System (EOS) Aqua/PM Flight Dynamics System (FDS)/EOS MISSION Operations System (EMOS) Interface Control Document (ICD)
- [FDS-FOT-Aqua](#), Earth Observing System (EOS) Aqua/PM Flight Dynamics System (FDS)/Flight Operations Team (FOT) Interface Control Document (ICD)
- [ICD-106](#), Interface Control Document (ICD) Data Format Control Book (DFCB) for EOS-AM Spacecraft
- [ICD-107](#), Direct Access System (DAS) User's Guide for the EOS-AM Spacecraft
- [EOS Mission Operations Segment Project Database Data Format Control Document](#)
- [ICD PM-1 S/C to EGS](#)
- [Interface Control Document Between Earth Observing System Control Center \(EOC\) and the independent verification and validation facility \(IVVF\) at GSFC and the Software Development and Validation Facility \(SDVF\) at TRW](#)
- [ICD between EOC and PM-1 Flight Ops Database](#)
- [ICD ETSF/EOC PM-1](#)
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Last revision: 11 November 1998

Responsible NASA Official: [Dr. Yun-Chi Lu](#)


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CCSDS Publications

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Obsolete (Withdrawn) Documents

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Approved Documents

Telemetry Systems (Panel 1)



CCSDS 100.0-G-1: Telemetry Summary of Concept and Rationale. Green Book. Issue 1. December 1987.

This **Report** presents the conceptual framework and rationale for the CCSDS Telemetry System. It provides background information supporting the two CCSDS technical Recommendations for Telemetry, Telemetry Channel Coding (101.0-B-3) and Packet Telemetry (102.0-B-3).



CCSDS 101.0-B-4: Telemetry Channel Coding. Blue Book. Issue 4. May 1999. The previous issue of this [Recommendation](#) has been adopted as ISO 11754:1994.

This [Recommendation](#) establishes a common framework and provides a common basis for the coding schemes used on spacecraft telemetry streams. The telemetry channel coding concept described is the baseline concept for spacecraft-to-ground data communication within missions that are cross supported between Agencies of the CCSDS.



CCSDS 102.0-B-4: Packet Telemetry. Blue Book. Issue 4. November 1995. This [Recommendation](#) has been adopted as ISO 13419:1997.

This [Recommendation](#) establishes a common framework and provides a common basis for the data structures of spacecraft telemetry streams. The Packet Telemetry concept described is the baseline concept for spacecraft-to-ground data communication within missions that are cross supported between

Agencies of the CCSDS. In this update to [CCSDS 102.0-B-3](#) (the previous issue), the option of Source Packet Segmentation has been removed.

[CCSDS 102.0-P-4.1](#). is a draft update for this document.



CCSDS 103.0-B-1: Packet Telemetry Services.. Blue Book. Issue 1. May 1996. This [Recommendation](#) has been adopted as ISO/FDIS 17433.

This [Recommendation](#) defines the services of a packet telemetry system. To do so, it establishes a layered model of Packet Telemetry protocols and defines Packet Telemetry Services by specifying the behavior at the service interfaces to each layer.



CCSDS 120.0-G-1: Lossless Data Compression.. Green Book. Issue 1. May 1997.

This [Report](#) presents a summary of the key operational concepts and rationale underlying the requirements for the CCSDS Recommendation, Lossless Data Compression. Supporting performance information along with illustrations are also included. This [Report](#) also provides a broad tutorial overview of the CCSDS Lossless Data Compression algorithm and is aimed at helping first-time readers to understand the Recommendation.



CCSDS 121.0-B-1: Lossless Data Compression.. Blue Book. Issue 1. May 1997. This [Recommendation](#) has been adopted as ISO/FDIS 15887.

This [Recommendation](#) defines a source-coding data-compression algorithm and specifies how data compressed using the algorithm are inserted into source packets for retrieval and decoding.

Telecommand Systems (Panel 1)



CCSDS 200.0-G-6: Telecommand Summary of Concept and Service. Green Book. Issue 6. January 1987.

In order to establish a common framework within which the Agencies may develop standardized telecommand services, the CCSDS advocates adoption of a layered systems architecture. Within this approach, specific layers of service (including their operational protocol and data structuring techniques) may be selected for implementation according to mission requirements. The current layered set of CCSDS telecommand Recommendations was developed to match the conventional free-flying mission environment, as characterized by the transmission of command data at relatively low uplink data rates to spacecraft of moderate complexity. This [Report](#) summarizes the principal concepts associated with the CCSDS recommended space mission telecommanding architecture.



CCSDS 201.0-B-3: Telecommand Part 1 -- Channel Service. Blue Book. Issue 3. June 2000. The previous issue of this Recommendation has been adopted as ISO 12171:1998.

This **Recommendation** was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the lowest telecommand system layers. In this update to [CCSDS 201.0-B-2](#), that simplifies the protocol by recommending a single standard codeblock length. The recommended length is the longest and most efficient (64 bits) of the options allowed in previous issues of the Blue Book. This update was prompted by industry suggestion that offering four codeblock sizes unnecessarily complicates the protocol, increases costs, and offers no benefit except possibly to accommodate some legacy missions.



CCSDS 202.0-B-2: Telecommand Part 2 -- Data Routing Service. Blue Book. Issue 2. November 1992. (Reconfirmed June 1998.) This **Recommendation** has been adopted as ISO 12172:1998.

This **Recommendation** for Telecommand Data Routing Service was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the intermediate telecommand system layers.



CCSDS 202.1-B-1: Telecommand Part 2.1 -- Command Operation Procedures. Blue Book. Issue 1. October 1991. This **Recommendation** has been adopted as ISO 12173:1998.

The Command Operation Procedure forms a subpart of the Data Routing Service, which is described in CCSDS 202.0-B-2. This **Recommendation** contains the definition of the Command Operation Procedure in the form of state tables at the level of detail necessary to allow cross support.



CCSDS 203.0-B-1: Telecommand Part 3 -- Data Management Service. Blue Book. Issue 1. January 1987. This **Recommendation** has been adopted as ISO 12174:1998.

This **Recommendation** was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the highest telecommand layers.

Ancillary Data Systems (Panel 1)



CCSDS 301.0-B-2: Time Code Formats. Blue Book. Issue 2. April 1990. This **Recommendation** has been adopted as ISO 11104:1991.

This **Recommendation** establishes a common framework and provides a common basis for the formats of time code data.



CCSDS 320.0-B-2: CCSDS Global Spacecraft Identification Field Code Assignment Control Procedures. Blue Book. Issue 1. November 1998.

This procedural **Recommendation** establishes control procedures for Spacecraft Identification (SCID) codes. As such, it defines the procedure governing assignment, use, relinquishment, and management of SCIDs. This **Recommendation** also provides a list of the CCSDS Agencies' Representatives as of the date of this document and a form for requesting and relinquishing SCIDs. This update to [CCSDS 320.0-B-1, October 1993](#) contains updates to the request form, references, and Agency Representative information.



CCSDS 350.0-G-1: The Application of CCSDS Protocols to Secure Systems. Green Book. Issue 1. January 1999.

This **Report** is intended to provide guidance to missions that wish to use the CCSDS Recommendations for spacecraft control and data handling but also require a level of security or data protection. The report provides background information on security, details various options for security implementation in space missions, and outlines the impact of security on defined CCSDS services.

RF and Modulation Systems (Panel 1)



CCSDS 401.0-B: Radio Frequency and Modulation Systems -- Part 1: Earth Stations and Spacecraft. Blue Book. Issue 2000-06. May 2000.

Numerous concise **Recommendations** appear in the notebook volume bearing the number 401.0-B. Each Recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near earth and deep space missions having moderate communications requirements.



CCSDS 411.0-G-3: Radio Frequency and Modulation -- Part 1: Earth Stations. Green Book. Issue 3. May 1997.

This **Report** contains specific Radio Frequency and Modulation characteristics of the spacecraft tracking and data-capture networks operated by the CCSDS Agencies. It is intended as a high-level compendium of information for use by flight projects and others wishing to ensure compatibility with these Agencies' tracking and data-collection facilities. This document replaces CCSDS 411.0-G-2.



CCSDS 412.0-G-1: Radio Frequency and Modulation Systems -- Spacecraft-Earth Station Compatibility Test Procedures. Green Book. Issue 1. May 1992.

This document is a CCSDS **Report** that contains explanatory material to supplement and clarify information contained in CCSDS 401-B. In particular, this Report contains the procedures to be used in

implementing Recommendation 401 (3.5.1) B-1, "Minimum Set of Spacecraft - Earth Station Tests Required to Ensure Compatibility."

Tracking and Navigation Systems (Panel 4)



CCSDS 501.0-B-1: Radio Metric and Orbit Data. Blue Book. Issue 1. January 1987. (Reconfirmed May 1994.) This [Recommendation](#) has been adopted as ISO 11103:1991.

The topic areas covered in this [Recommendation](#) include radio metric data, spacecraft orbital elements, solar system ephemeris, tracking station locations, astrometric data, reference systems, astrodynamic constants, and spacecraft dynamics parameters. It deals explicitly with the technical definitions and conventions associated with inter-Agency cross support situations involving the transfer of orbital elements and ground-based conventional radio metric data, i.e., Doppler and range.

Information Access and Interchange Systems (Panel 2)



CCSDS 610.0-G-5: Space Data Systems Operations with Standard Formatted Data Units: System and Implementation Aspects. Green Book. Issue 5. February 1987.

This [Report](#) concerns space data systems operations with Standard Formatted Data Units (SFDUs). It explains the rationale for operations with SFDUs, the initial operational requirements for SFDUs, and the major benefits to be expected from operations with SFDUs.



CCSDS 611.0-Y-1: CCSDS Panel 2 Methodology for Development of Recommendations. Yellow Book. Issue 1. March 1999.

This [Administrative Report](#) describes the methodology adopted by CCSDS Panel 2 for the development of Recommendations. It serves as a guide for CCSDS Panel 2 members as they develop Recommendations in the area of Information Interchange and will provide insight into the techniques and approaches used by Panel 2 in its development activity.



CCSDS 620.0-B-2.1: Standard Formatted Data Units -- Structure and Construction Rules (with Technical Corrigendum 1). Blue Book. Issue 2. November 1996. This [Recommendation](#) has been adopted as ISO 12175:1994.

This [Recommendation](#) defines Standard Formatted Data Unit (SFDU) structures that will handle some of the problems of digital data interchange and several construction rules that will limit the SFDUs to a practical set that can exist in an open data system environment.

This document updated [CCSDS 620.0-B-2, May 1992](#) which is essentially the same document without updates from [CCSDS 620.0-B-2 Cor. 1, November 1996](#) applied.



CCSDS 621.0-G-1: Standard Formatted Data Units -- A Tutorial. Green Book. Issue 1. May 1992.

This **Report** explains the rationale of the Standard Formatted Data Unit (SFDU) concept and outlines the Structure and Construction Rules with the help of examples. It supports the main SFDU Recommendation, CCSDS 620.0-B-2.



CCSDS 622.0-B-1: Standard Formatted Data Units - Referencing Environment.. Blue Book. Issue 1. May 1997. This **Recommendation** has been adopted as ISO/FDIS 15888.

This **Recommendation** extends the standardization of the Standard Formatted Data Unit (SFDU) concept in support of the digital transfer of space-related information. This **Recommendation** defines valid CCSDS Referencing Environments and provides syntax specifications for expressing file names within those Referencing Environments.



CCSDS 630.0-B-1: Standard Formatted Data Units -- Control Authority Procedures. Blue Book. Issue 1. June 1993. This **Recommendation** has been adopted as ISO 13764:1996.

This **Recommendation** defines the responsibilities that must be assumed and the services that must be provided by the participating CCSDS Agencies in order to facilitate the creation and operation of the Control Authority organization. The primary function of this organization is to register and disseminate data description information.



CCSDS 631.0-G-2: Standard Formatted Data Units -- Control Authority Procedures Tutorial. Green Book. Issue 2. November 1994.

This **Report** describes the Control Authority (CA) organization from both an implementer's and a user's perspective. This document serves as a companion document to CCSDS 630.0-B-1, and as such, is intended to provide a tutorial for the procedures and services identified in the Control Authority Procedures Recommendation, background to assist in the effective implementation of the Control Authority Procedures Recommendation, and rationale and requirements for the Control Authority organization. It also serves as a companion to CCSDS 632.0-B-1, and as such, is intended to provide a tutorial on the use of the Control Authority Data Structures.



CCSDS 632.0-B-1: Standard Formatted Data Units -- Control Authority Data Structures. Blue Book. Issue 1. November 1994. This **Recommendation** has been adopted as ISO 15395:1998.

This **Recommendation** defines the data structures used by the Control Authority Organization for registering, revising, and disseminating data descriptions.



CCSDS 641.0-B-2: Parameter Value Language Specification (CCSD0006 and CCSDS0008). Blue Book. Issue 2. June 2000. The previous issue of this [Recommendation](#) has been adopted as ISO 14961:1997.

This [Recommendation](#) defines the Parameter Value Language (PVL), which provides a human-readable, machine-processable language for naming and expressing data values.



CCSDS 641.0-G-1: Parameter Value Language -- A Tutorial. Green Book. Issue 1. May 1992.

This [Report](#) describes the Parameter Value Language (PVL) and provides a description of how and why one would use this language for information interchange.



CCSDS 642.1-G-1: Language Usage in Information Interchange Tutorial. Green Book. Issue 1. October 1989.

This [Report](#) is a tutorial on the use of languages for descriptive purposes in information interchange. It discusses some of the challenges involved in the interchange of information in the international space community. It assumes the use of the Standard Formatted Data Unit (SFDU) as a methodology for information interchange.



CCSDS 643.0-B-1: ASCII Encoded English (CCSD0002). Blue Book. Issue 1. November 1992. This [Recommendation](#) has been adopted as ISO 14962:1997.

This [Recommendation](#) defines the usage of ASCII Encoded English and its representation as a data description language.



CCSDS 644.0-B-1: The Data Description Language EAST Specification (CCSD0010).. Blue Book. Issue 1. May 1997. This [Recommendation](#) has been adopted as ISO/FDIS 15889.

This [Recommendation](#) defines the EAST language used to create descriptions of data, called Data Description Records (DDR). Such DDRs ensure a complete and exact understanding of the data and allow it to be interpreted in an automated fashion. A software tool is able to analyze a DDR, interpret the format of the associated data, and extract values from the data on any host machine (i.e., on a different machine from the one that produced the data).

[CCSDS 644.0-P-1.1](#). is a draft update for this document.



CCSDS 645.0-G-1: The Data Description Language EAST - A Tutorial.. Green Book. Issue 1. May 1997.

This **Report** contains rationale and explanatory material for the data description language EAST. This document explains the description capabilities of EAST and provides examples and justifications of syntactic rules.



CCSDS 646.0-G-1: The Data Description Language EAST - List of Conventions.. Green Book. Issue 1. May 1997.

This **Report** establishes an evolving list of conventions used in the data generation process to produce real numbers. These conventions are referenced in EAST Data Descriptions (see CCSDS 644.0-B-1) and could be referenced in other Data Description Records (DDR), written in other Data Description Languages (DDLs).

Advanced Orbiting Systems (Panel 1)



CCSDS 700.0-G-3: Advanced Orbiting Systems, Networks and Data Links: Summary of Concept, Rationale and Performance. Green Book. Issue 3. November 1992.

This CCSDS **Report** contains background and explanatory material to supplement the CCSDS Recommendation, Advanced Orbiting Systems, Network and Data Links: Architectural Specification, 701.0-B-2.



CCSDS 701.0-B-2: Advanced Orbiting Systems, Networks and Data Links: Architectural Specification. Blue Book. Issue 2. November 1992. This **Recommendation** has been adopted as ISO 13420:1997.

This **Recommendation** extends the previous set of CCSDS Recommendations for conventional missions to accommodate extra services needed by Advanced Orbiting Systems. Target Advanced Orbiting Systems include manned and man-tended space stations, unmanned space platforms, free-flying spacecraft, and new space transportation systems, many of which require a richer repertoire of data handling services than are provided by the conventional Recommendations.



CCSDS 704.0-B-1: Advanced Orbiting Systems, Networks and Data Links: Audio, Video, and Still-Image Communications Services. Blue Book. Issue 1. May 1994. This **Recommendation** has been adopted as ISO/FDIS 15890.

This **Recommendation** is intended for use by participating space Agencies in their development of space data transmission systems that support the transfer of audio, video, and still-image data.



CCSDS 704.1-G-3: Advanced Orbiting Systems, Networks and Data Links: Audio, Video and Still-Image Communications Services. Green Book. Issue 3. May 1994.

This **Report** Concerning Audio, Video and Still-Image Communications Services provides guidelines

for the implementation of Agency-specific and CCSDS-standardized audio, video and still-image services on the base of the Advanced Orbiting Systems (AOS) defined by CCSDS (see CCSDS 701.0-B-2). It supports the Recommendation for Audio, Video and Still-Image Communications Services (CCSDS 704.0-B-2), which defines a set of standardized CCSDS audio, video and still-image services for cross support between Agencies.



CCSDS 705.0-G-2: Advanced Orbiting Systems, Networks and Data Links: Formal Definition of CPN Protocols, Methodology and Approach. Green Book. Issue 2. October 1993.

This technical **Report** contains explanatory material on the program of validation applied to the protocols and services defined in the CCSDS Recommendation for Advanced Orbiting Systems, Networks and Data Links: Architectural Specification, CCSDS 701.0-B-2.



CCSDS 713.0-B-1: Space Communication Protocol Specification (SCPS) - Network Protocol. Blue Book. Issue 1. May 1999. This **Recommendation** has been adopted as ISO/FDIS 15891.

The four Space Communication Protocol Specification (SCPS) **Recommendations** define a protocol suite that is parallel in function to, and interoperable with, the protocols of the Earth-based Internet (FTP/TCP/IP). The SCPS protocols have been optimized to overcome problems associated with using Internet protocols in space.



CCSDS 713.5-B-1: Space Communication Protocol Specification (SCPS) - Security Protocol. Blue Book. Issue 1. May 1999. This **Recommendation** has been adopted as ISO/FDIS 15892.

The four Space Communication Protocol Specification (SCPS) **Recommendations** define a protocol suite that is parallel in function to, and interoperable with, the protocols of the Earth-based Internet (FTP/TCP/IP). The SCPS protocols have been optimized to overcome problems associated with using Internet protocols in space.



CCSDS 714.0-B-1: Space Communication Protocol Specification (SCPS) - Transport Protocol. Blue Book. Issue 1. May 1999. This **Recommendation** has been adopted as ISO/FDIS 15893.

The four Space Communication Protocol Specification (SCPS) **Recommendations** define a protocol suite that is parallel in function to, and interoperable with, the protocols of the Earth-based Internet (FTP/TCP/IP). The SCPS protocols have been optimized to overcome problems associated with using Internet protocols in space.



CCSDS 717.0-B-1: Space Communication Protocol Specification (SCPS) - File Protocol. Blue Book. Issue 1. May 1999. This **Recommendation** has been adopted as ISO/FDIS 15894.

The four Space Communication Protocol Specification (SCPS) **Recommendations** define a protocol suite that is parallel in function to, and interoperable with, the protocols of the Earth-based Internet (FTP/TCP/IP). The SCPS protocols have been optimized to overcome problems associated with using Internet protocols in space.

Cross Support Concepts, Services and Architecture (Panel 3)



CCSDS 910.2-G-1: Standard Terminology, Conventions, and Methodology (TCM) for Defining Data Services. Green Book. Issue 1. November 1994.

This **Report** is a summary of, and cross-reference to, internationally adopted standards for defining data services, and is the result of a study of different data service definition conventions conducted in support of the definition of CCSDS Space Link Extension services. The material contained in the Report is not limited to Space Link Extension services and may be applicable to other data service definition activities of CCSDS and its member Agencies.



CCSDS 910.3-G-1: Cross Support Concept - Part 1: Space Link Extension Services. Green Book. Issue 1. May 1995.

This **Report** presents the cross support concept for CCSDS Space Link Extension (SLE) services. It identifies the functional components of the ground-resident portion of a space data system and defines the interface points where agency interoperations may occur. This **Report** summarizes the technical considerations for all cross support of CCSDS-compliant space data systems.



CCSDS 910.4-B-1: Cross Support Reference Model Part 1: Space Link Extension Services. Blue Book. Issue 1. May 1996. This **Recommendation** has been adopted as ISO 15396:1998.

This **Recommendation** establishes a common framework and provides a common basis for the specification of data services that extend the space-to-ground communication services previously defined by CCSDS. It allows implementing organizations within each agency to proceed coherently with the development of compatible derived standards for the ground systems that are within their cognizance.

Administration (Management Council)



CCSDS A00.0-Y-7.2: Procedures Manual for the Consultative Committee for Space Data Systems. Yellow Book. Issue 7.2 June 1998.

This **Administrative Report** is a Procedures Manual which describes the principles and details

governing the CCSDS. The document addresses the objectives, organization, participation, operations, and management of CCSDS activities.



CCSDS A01.1-Y-1: Strategic Plan of the Consultative Committee for Space Data Systems. Yellow Book. Issue 1. December 1999.

This **Administrative Report** defines the vision, mission, strategic goals, and domains for standardization for the CCSDS as a whole and for its technical panels.



This document is available as [a screen resolution color file](#),  [a print resolution color file](#), or



[a greyscale print resolution](#).



CCSDS A01.2-Y-1: CCSDS Operating Plan for Standards Development. Yellow Book. Issue 1. December 1999.

This **Administrative Report** supplements the [Strategic Plan of the Consultative Committee for Space Data Systems](#) by providing organizational details, plans of work, and strategic themes that outline areas where standardization is needed within the three CCSDS Domains for Standardization identified in the Strategic Plan.



CCSDS A10.0-Y-5: Achievements and Products. Yellow Book. Issue 5. April 1995.

This **Administrative Report** presents an overview of the history, functions, achievements, and products of the CCSDS. It includes an annotated listing of panel products and a summary of applications of CCSDS Recommendations by standards organizations and products.



CCSDS A10.1-Y-3.1: CCSDS Leaflet Yellow Book. Issue 3.1. May 1997.

This **Administrative Report** is a single two-sided page leaflet which provides a quick overview of the CCSDS. It includes a summary of the CCSDS Organization, Goals and Benefits, the CCSDS End-to-End System, the CCSDS High Level Functional Model, and a list of CCSDS Recommendations.



This document is also available on A4 size paper here:



CCSDS A12.0-G-1: CCSDS-Related Implementations . Green Book. Issue 1. November 1996.

This **Report** contains a registration of all CCSDS related technical implementations known to the CCSDS Secretariat at the time of publication.



CCSDS A20.0-Y-1: CCSDS Publications Manual. Yellow Book. Issue 1. May 1994.

This **Administrative Report** defines a set of style specifications intended to standardize the appearance and format of CCSDS publications. It is intended to serve as both a guide for CCSDS document developers and an editorial manual for publishers of CCSDS documents.



CCSDS A30.0-G-3: Consultative Committee for Space Data Systems Glossary. Green Book. Issue 3. July 1997.

This **Report** consolidates glossaries provided by the active technical panels of the Consultative Committee for Space Data Systems (CCSDS).

Technical Corrigendum Documents

Ancillary Data Systems (Panel 1)



CCSDS 320.0-B-1 COR-1: CCSDS Global Spacecraft Identification Field Code Assignment Control Procedures. Blue Book. Issue 1. October 1993. Technical Corrigendum. Issue 1 - Corrigendum 1. November 1997.

This **Corrigendum** documents updates for [CCSDS 320.0-B-1, October 1993](#). These updates have been applied in [CCSDS 320.0-B-1, November 1996](#).

Information Access and Interchange Systems (Panel 2)



CCSDS 620.0-B-2 COR-1: Standard Formatted Data Units -- Structure and Construction Rules - Technical Corrigendum 1. Technical Corrigendum. Issue 2 - Corrigendum 1. November 1997. This **Recommendation** has been adopted as ISO 12175:1994.

This **Corrigendum** documents updates for [CCSDS 620.0-B-2, May 1992](#). This updates have been applied in [CCSDS 620.0-B-2, November 1996](#).

Documents Under Review

Warning!

Red and Pink Books are **Draft Recommendations**. Red Books lead up to the first issue of the Recommendation. Pink Books (or Pink Sheets) are proposed updates where a Recommendation already exists. Significant changes may be made between the Red or Pink Book **Draft Recommendation** and a Blue Book Approved **Recommendation**. In fact several issues of a Red or Pink Book may be issued, each with significant differences from the other Red Book issues, before the approved Blue Book Recommendation is approved. Red Books and Pink Books are issues for information and review only. Readers should not assume that the final version will match the Red or Pink Books. Readers are particularly cautioned against using Red or Pink Books for product design or contract specification. Draft documents are subject to change, and the draft CCSDS Recommendation referenced here does **not** necessarily represent consensus technical agreement among the CCSDS Member Agencies.

Similarly Draft Green Books are draft versions of CCSDS Reports and may undergo significant revisions before final approval and release. Readers are particularly cautioned against using a Draft Green Book for product design or contract specification.

Note:

Review instructions and due dates differ for different organizations, and several general organizational categories are defined for each review. Please select the most appropriate link from among those provided.

For reviewers who are not formally affiliated with any of the listed categories: non-U.S. reviewers should select "CCSDS Agency (excluding NASA)"; U.S. reviewers should select "NASA-Sponsored CCSDS Associate."

Telemetry Systems (Panel 1)

CCSDS 102.0-P-4.1: Packet Telemetry. Pink Sheets. Issue 4.1. June 2000.

If approved, this will be the fifth issue of this Recommendation. This will update the previous issue, [CCSDS 102.0-B-4](#).

This **Draft Recommendation** is an update to issue 4 of the CCSDS Packet Telemetry Recommendation. It adds specifications that allow the CCSDS Version-1 Telemetry Transfer Frame to be used to transport other types of packets in addition to CCSDS Version-1 Packets, including CCSDS Network Protocol (NP) Packets and Internet Protocol (IP) packets. This enhanced functionality is added to the Transfer Frame through the introduction of a standardized approach to interpreting the packet version number field. The format of the Transfer Frame is not changed.

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Telecommand Systems (Panel 1)



CCSDS 211.0-R-2: Proximity-1 Space Link Protocol. Red Book. Issue 2. January 2000.
If approved, this will be the first issue of this Recommendation.

This **Draft Recommendation** defines physical- and data link-layer communications services and protocols for proximity space links. Proximity space links are defined to be short-range, bi-directional, fixed or mobile radio links, generally used to communicate among fixed probes, landers, rovers, orbiting constellations, and orbiting relays. These links are characterized by short time delays, moderate (not weak) signals, and short, independent sessions. The Proximity-1 Recommendation is being developed to support the communications requirements of future planetary missions, particularly those of upcoming Mars missions. The Recommendation is expected also to be applicable to various types of near-Earth missions having requirements for spacecraft-to-spacecraft communications. This issue-2 Red Book incorporates changes resulting from review of the first issue.

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Information Access and Interchange Systems (Panel 2)



CCSDS 644.0-P-1.1: The Data Description Language EAST Specification (CCSD0010). Pink Sheets. Issue 1.1. June 2000.

If approved, this will be the second issue of this Recommendation.

This **Draft Recommendation** is an update to the Data Description Language EAST Recommendation that extends EAST ability to handle repeated data items where repetition is terminated by a marker. The current specification only allows this at the first level of data hierarchy. These updates allow it at any level in the data hierarchy.

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CCSDS 647.1-R-2: Data Entity Dictionary Specification Language (DEDSL) - Abstract Syntax (CCSD0011). Red Book. Issue 2. June 2000.

If approved, this will be the first issue of this Recommendation.

This **Draft Recommendation** provides the abstract definition of the semantic information that is required to be conveyed and presents the specification in a layered manner (attributes, entities, dictionaries). As such the actual technique used to convey the information is independent of the information content; therefore the same abstract standard can be used within different formatting environments, and the semantic information may be translated to different representations as may be needed when data are transferred across different domains.

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CCSDS 647.2-R-2: Data Entity Dictionary Specification Language (DEDSL) - PVL Syntax (CCSD0012). Red Book. Issue 2. June 2000.

If approved, this will be the first issue of this Recommendation.

This **Draft Recommendation** provides a standard method to represent the attributes and their values, as defined by the draft Recommendation for [DEDSL - Abstract Syntax](#), using the Parameter Value Language for the construction and interchange of data entity dictionaries.

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CCSDS 650.0-R-1: Reference Model for an Open Archival Information System (OAIS). Red Book. Issue 1. May 1999.

If approved, this will be the first issue of this Recommendation.

This **Draft Recommendation** defines a reference model and a set of requirements for the long-term preservation of data.

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Advanced Orbiting Systems (Panel 1)



CCSDS 710.0-G-0.3: Space Communication Protocol Specification (SCPS) - Rationale, Requirements, and Application Notes. Draft Green Book. Issue 0.3. April 1997.

If approved, this will be the first issue of this Report.

This **Draft Report** contains background and rationale information in support of the four Space Communication Protocol Specification (SCPS) **Draft Recommendations** - [Space Communication Protocol Specification \(SCPS\) - Network Protocol](#), [Space Communication Protocol Specification \(SCPS\) - Security Protocol](#), [Space Communication Protocol Specification \(SCPS\) - Transport Protocol](#), and [Space Communication Protocol Specification \(SCPS\) - File Protocol](#). Together these define an upper-layer protocol suite for efficient forward-link and return-link communication services for space-related data and information interchange.

Agency comments were due 13 June 1997.



CCSDS 711.0-G-0.2: Space Communications Protocol Specification (SCPS) Users Guide (SCPS-UG). Draft Green Book. Issue 0.2. September 1997.

If approved, this will be the first issue of this Report.

This **Draft Report** is a users guide supporting the four Space Communication Protocol Specification (SCPS) **Draft Recommendations** - [Space Communication Protocol Specification \(SCPS\) - Network Protocol](#), [Space Communication Protocol Specification \(SCPS\) - Security Protocol](#), [Space](#)

[Communication Protocol Specification \(SCPS\) - Transport Protocol](#), and [Space Communication Protocol Specification \(SCPS\) - File Protocol](#). Together these define an upper-layer protocol suite for efficient forward-link and return-link communication services for space-related data and information interchange.

Agency comments were due 13 September 1998.



CCSDS 720.1-G-0.5: CCSDS File Delivery Protocol (CFDP)--Part 1: Introduction and Overview. Draft Green Book. Issue 0.5. July 1999.

If approved, this will be the first issue of this Report.

Questions or comments regarding this document may be directed to:

Mr. Richard D. Carper
3934 N.W. Sitka Place
Corvallis, OR 97330-3344
USA

E-mail: rcarper@proaxis.com



CCSDS 720.2-G-0.5: CCSDS File Delivery Protocol (CFDP)--Part 2: Implementers Guide. Draft Green Book. Issue 0.5. July 1999.

If approved, this will be the first issue of this Report.

Questions or comments regarding this document may be directed to:

Mr. Richard D. Carper
3934 N.W. Sitka Place
Corvallis, OR 97330-3344
USA

E-mail: rcarper@proaxis.com



CCSDS 727.0-R-3: CCSDS File Delivery Protocol (CFDP). Red Book. Issue 3. May 1999.

If approved, this will be the first issue of this Recommendation.

This Red Book issue is believed to be stable and is being used for implementation testing. However, changes between this Red Book issue and the final Blue Book can not be ruled out.

Questions or comments regarding this document may be directed to:

Mr. Richard D. Carper
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Cross Support Concepts, Services and Architecture (Panel 3)



CCSDS 910.5-R-1: Space Link Extension - Service Management Specification. Red Book. Issue 1. December 1999.

If approved, this will be the first issue of this Recommendation.

This **Draft Recommendation** establishes the common aspects of Service Management for the specification of data services that extend the space to ground communication services previously defined by CCSDS. It provides a common basis for scheduling, monitoring, and controlling SLE transfer services provided by an SLE system to a space mission. It also specifies the management information that is required to provide SLE transfer services, the interfaces that are involved, and the sequencing that is necessary.

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CCSDS 912.1-R-2: Space Link Extension - Forward CLTU Service Specification. Red Book. Issue 2. May 2000.

If approved, this will be the first issue of this Recommendation.

This **Draft Recommendation** defines the Space Link Extension (SLE) Forward CLTU service in conformance with the transfer services specified in Cross Support Reference Model - Part 1: SLE Services (CCSDS 910.4-B-1). The current issue incorporates changes resulting from review of the first issue, project experience, and CCSDS Panel 3 Working Group discussion.

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Superseded Documents

Telemetry Systems (Panel 1)



CCSDS 101.0-B-3: Telemetry Channel Coding. Blue Book. Issue 3. May 1992. This [Recommendation](#) has been adopted as ISO 11754:1994.

This [Recommendation](#) establishes a common framework and provides a common basis for the coding schemes used on spacecraft telemetry streams. The telemetry channel coding concept described is the baseline concept for spacecraft-to-ground data communication within missions that are cross supported between Agencies of the CCSDS.

This document has been superseded by [CCSDS 101.0-B-4](#).



CCSDS 102.0-B-3: Packet Telemetry. Blue Book. Issue 3. November 1992. Issue 4 [Recommendation](#) has been adopted as ISO 13419:1997.

This [Recommendation](#) establishes a common framework and provides a common basis for the data structures of spacecraft telemetry streams. The Packet Telemetry concept described is the baseline concept for spacecraft-to-ground data communication within missions that are Cross supported between Agencies of the CCSDS.

This document has been superseded by [CCSDS 102.0-B-4](#).

Telecommand Systems (Panel 1)



CCSDS 201.0-B-2: Telecommand Part 1 -- Channel Service. Blue Book. Issue 2. November 1995. The previous issue of this [Recommendation](#) has been adopted as ISO 12171:1998.

This [Recommendation](#) was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the lowest telecommand system layers. In this update to [CCSDS 201.0-B-1](#), that simplifies the protocol by recommending a single standard codeblock length. The recommended length is the longest and most efficient (64 bits) of the options allowed in previous issues of the Blue Book. This update was prompted by industry suggestion that offering four codeblock sizes unnecessarily complicates the protocol, increases costs, and offers no benefit except possibly to accommodate some legacy missions.

This document has been superseded by [CCSDS 201.0-B-3](#).



CCSDS 201.0-B-1: Telecommand Part 1 -- Channel Service. Blue Book. Issue 1. January 1987. (Reconfirmed October 1990.) This [Recommendation](#) has been adopted as ISO 12171:1998.

This **Recommendation** was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the lowest telecommand system layers.

This document has been superseded by [CCSDS 201.0-B-2](#).

Ancillary Data Systems (Panel 1)



CCSDS 320.0-B-1: CCSDS Global Spacecraft Identification Field Code Assignment Control Procedures. Blue Book. Issue 1. October 1993. (With Corrigenda through Technical Corrigendum 1, November 1996.)

This procedural **Recommendation** establishes control procedures for Spacecraft Identification (SCID) codes. As such, it defines the procedure governing assignment, use, relinquishment, and management of SCIDs. This **Recommendation** also provides a list of the CCSDS Agencies' Representatives as of the date of this document and a form for requesting and relinquishing SCIDs.

This document updated [CCSDS 320.0-B-1, October 1993](#) which is essentially the same document without updates from [CCSDS 320.0-B-1 Cor. 1, November 1996](#) applied.

This document has been superseded by [CCSDS 320.0-B-2, November 1998](#).



CCSDS 320.0-B-1: CCSDS Global Spacecraft Identification Field Code Assignment Control Procedures. Blue Book. Issue 1. October 1993.

This procedural **Recommendation** establishes control procedures for Spacecraft Identification (SCID) codes. As such, it defines the procedure governing assignment, use, relinquishment, and management of SCIDs. This **Recommendation** also provides a list of the CCSDS Agencies' Representatives as of the date of this document and a form for requesting and relinquishing SCIDs.

This document has been superseded by [CCSDS 320.0-B-1, November 1996](#) which is essentially the same document with updates from [CCSDS 320.0-B-1 Cor. 1, November 1996](#) applied.

RF and Modulation Systems (Panel 1)



CCSDS 401.0-B: Radio Frequency and Modulation Systems -- Part 1: Earth Stations and Spacecraft. Blue Book. Issue 4. May 1999.

Numerous concise **Recommendations** appear in the notebook volume bearing the number 401.0-B. Each Recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near earth and deep space missions having moderate

communications requirements.

This document has been superseded by [CCSDS 401.0-B, May 2000](#) which is essentially the same document with new pages added.



CCSDS 401.0-B: Radio Frequency and Modulation Systems -- Part 1: Earth Stations and Spacecraft. Blue Book. Issue 3. May 1998.

Numerous concise **Recommendations** appear in the notebook volume bearing the number 401.0-B. Each Recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near earth and deep space missions having moderate communications requirements.

This document has been superseded by [CCSDS 401.0-B, May 1999](#) which is essentially the same document with new pages added.



CCSDS 401.0-B: Radio Frequency and Modulation Systems -- Part 1: Earth Stations and Spacecraft. Blue Book. Issue 2. November 1994.

Numerous concise **Recommendations** appear in the notebook volume bearing the number 401.0-B. Each Recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near earth and deep space missions having moderate communications requirements.

This document has been superseded by [CCSDS 401.0-B, May 1999](#) which is essentially the same document with new pages added.



CCSDS 401.0-B: Radio Frequency and Modulation Systems -- Part 1: Earth Stations and Spacecraft. Blue Book. Issue 1. June 1993.

Numerous concise **Recommendations** appear in the notebook volume bearing the number 401.0-B. Each Recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near earth and deep space missions having moderate communications requirements.

This document has been superseded by [CCSDS 401.0-B, May 1999](#) which is essentially the same document with new pages added.

Information Access and Interchange Systems (Panel 2)



CCSDS 620.0-B-2: Standard Formatted Data Units -- Structure and Construction Rules (without Technical Corrigendum). Blue Book. Issue 2. May 1992. This **Recommendation has been adopted as ISO 12175:1994.**

This **Recommendation** defines Standard Formatted Data Unit (SFDU) structures that will handle some of the problems of digital data interchange and several construction rules that will limit the SFDUs to a practical set that can exist in an open data system environment.

This document has been superseded by [CCSDS 620.0-B-2, November 1996](#) which is essentially the same document with updates from [CCSDS 620.0-B-2 Cor. 1, November 1996](#) applied.



CCSDS 641.0-B-1: Parameter Value Language Specification (CCSD0006). Blue Book. Issue 1. May 1992. This **Recommendation** has been adopted as ISO 14961:1997.

This **Recommendation** defines the Parameter Value Language (PVL), which provides a human-readable, machine-processable language for naming and expressing data values.

This document has been superseded by [CCSDS 641.0-B-2](#).

Administration (Management Council)

Obsolete (Withdrawn) Documents

Advanced Orbiting Systems (Panel 1)



CCSDS 705.1-B-1: Advanced Orbiting Systems, Networks and Data Links: Abstract Data Type Library -- Addendum to CCSDS 701.0-B-2. Blue Book. Issue 1. May 1994.

This **Recommendation** is an addendum to CCSDS 701.0-B-2. It is written using the ISO Formal Description Technique LOTOS and contains a library of Abstract Data Types used by the formal specifications contained in CCSDS 705.2-B-1, CCSDS 705.3-B-1, and CCSDS 705.5-B-1. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.



CCSDS 705.2-B-1: Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the Path Service and Protocol -- Addendum to CCSDS 701.0-B-2. Blue Book. Issue 1. May 1994.

This **Recommendation**, written using the ISO Formal Description Technique LOTOS, contains a formal specification of the Path Layer Protocol and Service, described in Natural Language in CCSDS 701.0-B-2. Annex A contains a set of tests, also written using LOTOS, which specify the required behavior of the Path Layer Protocol and Service under certain control and input conditions. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.



CCSDS 705.3-B-1: Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCLC Service and Protocol -- Addendum to CCSDS 701.0-B-2. Blue Book. Issue 1. May 1994.

This **Recommendation**, written using the ISO Formal Description Technique LOTOS, contains a formal specification of the VCLC Layer Protocol and Service, described in Natural Language in CCSDS 701.0-B-2. Annex A contains a set of tests, also written using LOTOS, which specify the required behavior of the VCLC Layer Protocol and Service under certain control and input conditions. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.



CCSDS 705.4-B-1: Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCA Service and Protocol -- Addendum to CCSDS 701.0-B-2. Blue Book. Issue 1. May 1994.

This **Recommendation**, written using the ISO Formal Description Technique LOTOS, contains a formal specification of the VCA Protocol and Service, described in Natural Language in CCSDS 701.0-B-2. Annex A contains a set of tests, also written using LOTOS, which specify the required behavior of the VCA Protocol and Service under certain control and input conditions. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.

Hard copies of any of these documents may be obtained from:

GSFC Aerospace Data Standards Office
Goddard Space Flight Center
Code 730.4
Greenbelt, MD 20770

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